Have fun living healthily!

An ethnological study of museums promoting health

Bønnelycke, Julie

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Have fun living healthily!

An ethnological study of museums promoting health

Industrial PhD Thesis

Julie Bønnelycke

Name of company	Steno Diabetes Center Copenhagen
Name of department:	Department of Ethnology
Author(s):	Julie Bønnelycke
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Supervisor: Company supervisor Third party supervisor	Astrid Pernille Jespersen Peter Bentsen Tine Tjørnhøj-Thomsen
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Front page photo:	Experimentarium explainer performs a dissection for participants at the Xbus. Photo: Experimentarium

1The PULSE Plaza Exhibition, Experimentarium

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Words of gratitude

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THANK YOU

2 Characters from the PULSE universe, Experimentarium

Preface

When I commenced this PhD-project I was in my late 20'ies, had no children and lived a fairly active life in a central part of Copenhagen, biking around, working out 4-5 times a week, pretty much managing my everyday life as I liked. Having worked with social studies of science and health for years, and having a more-than-average knowledge about health, causes of lifestyle diseases and the challenges of health communication I had, I thought, a pretty good point of departure for working with a health promotion project for families with children[1].
Some years later, with two children under the age of 4, a house and a long commute to a demanding job, I had a somewhat better conception of some of the factors complicating the efforts to sustain an active and healthy everyday life when your time, body and energy is no longer entirely your own, and other concerns are more prevalent than taking care of yourself. I found myself solidly enmeshed in the collective practices of a household with children; found that my values, ideas and actions gravitated towards the merciless and relentless tasks and needs of a household collective. These realisations, of course, have shaped my approach to the project, influencing my ability to understand the families who participated in the project, for better and for worse. The intentions of the project spoke to me in new ways that both fuelled and provoked me. I found myself identifying far more with the frustrations and challenges recounted by the families, but also annoyed by the well-intentioned pressure to constantly do better, be better, achieve more, that is aimed at families in the present day. It seems like everybody has an opinion on how parents should raise their children, what they should eat and consume, how they should run their career, and with what attitude they should bear all the advice and debate directed at them. In the course of the PhD, I thus found new points of interests in the project that both inspired and worried me. Did I identify too strongly with the issue? Was I too entangled to grasp it properly, did I project my own emotions unto the participants? Being an ethnologist through and through, I was always aware that my research was situated and contingent, and that reflexivity and transparency were in order. But as with my vain belief that I understood health from the perspective of families with children, one thing is to know it in abstract, another is truly

[1] The phrase '*you know nothing, Jon Snow*', comes to mind (Martin, 2000)

experiencing it. In the process of writing this PhD I was nevertheless countless times overwhelmed by the impact that 'life' and its serendipities and struggles had on the production of the PhD, the PULSE project and the knowledge we produce and communicate. Intentions and project descriptions, scripts and expectations met counter scripts and chaotic practices. People participate in unexpected ways, or not at all. Money run out, deadlines pass, departments are closed, companies merge, new strategies are written and managers change jobs. People get sick, have babies, go on leave, some come back and some do not, leaving a gaping hole that is only sometimes filled by something or someone else. I changed, Steno Diabetes Center changed, Experimentarium changed, and PULSE changed.

The project I initiated in 2013 is not the same project I wrote up in 2018. The progress of time and life interfered. The socio-material assemblage and the entangled practices that constitute this project are ever in flux, and any description and analysis produced in it are stills of a constantly moving process; tiny incisions artificially frozen in time, echoes of actions transformed into something else. They are written by the researcher that emerges as an effect of collective practices. The research was shaped by the entanglement of interests of the numerous stakeholders in the project, by the positions I was granted in the project, the negotiations of expertise, power and competence that were painstakingly performed throughout the collaboration, which was enmeshed in a web of political, financial, and moral agendas.

Health and living the good life are at once infinitely personal and highly political; they are individual experiences, collective performances and societal matters of concern. The notion of health seems to continuously seep into new arenas and mobilise new actors, shaping and imbuing new practices with health meanings. One of these arenas is the museum. In this dissertation, I grapple with these different levels of influence, the entanglements of social and material agents, of discourses, values, emotions, competences, and the conflicts and harmonies between them, that all shape how health promotion is performed. I turn my attention towards the performance of health as a matter of concern in the informal learning environment of the science centre. Having worked with museum communication for some years, and having a deep-felt passion for this field, the project united my greatest research interests. It also meant spanning across – sometimes confusedly vacillating between – quite different fields, with different epistemologies, methodologies and very different areas of interest and success criteria, not quite fitting in neither here, nor there. The project was also very much a search for an approach that could connect and bridge fields, and bring in different perspectives without losing foothold or becoming diluted. It

was an exercise in studying two fields without falling between two stools. I felt that it made sense to study the meeting between the two fields of health promotion and museum education with the perspectives from Science and Technology Studies, spanning across issues of knowledge production, user involvement, and public engagement with socio-scientific issues. In my analyses, I move in and out of the science centre, tracking the motions of health promotion as performed in the PULSE project, from design workshops and confusing ideas, to exhibition hall, to the everyday life, homes and neighbourhoods of the participating families. This dissertation does not evaluate the effects of PULSE, and it does not claim to prescribe the best methods for health promotion or the inclusion of underserved groups. It unfolds the complexities and contingencies of health promotion, describing the production of a scientific and communication practice that seeks to influence how people live, perceive health, and constitute them as health promotion subjects, participants, families, and community members in specific ways.

Summary

This dissertation is based on an ethnological study of the PULSE project; a health promoting project collaboration between Steno Diabetes Center Copenhagen and the Danish science centre Experimentarium. The aim of the PULSE project has been to employ participatory and research-based methods to develop a science centre exhibition and community activities that increase physical activity and science centre attendance amongst families of different socio-economic status.

As an Industrial PhD at Steno Diabetes Center Copenhagen, I have partaken in this process, conducting a double cultural analysis by performing qualitative fieldwork and user involvement, while studying the methods, values and relations produced by PULSE. My fieldwork amongst the target groups pointed to health as a collective matter and emphasised the everyday struggles to balance practices of health and family life, thus pointing to a mismatch between the everyday efforts to deal with health as a practical issue, and the venture to promote health in ways that are more fun, appealing or accessible. The findings from the fieldwork show, that the barrier for change was not so much lack of knowledge, but a framing of change that did not resonate with how everyday life is performed and arranged in collectives and practicalities. I suggest making collectives the target for situated interventions based on tinkering and the practical management of household roles, tasks and dynamics.

Based on the analyses of PULSE and other cases of health promoting exhibitions, I argue that they tend to produce collateral realities and ontological norms that have adverse effects. Thus, in PULSE, through the efforts to promote inclusion and participation, an ideal figure of the participating subject was produced, and certain modes of participation were afforded, that did not accommodate the diverse practices of enacting health, citizenship and participation in the everyday lives of the different target groups. The participatory processes that were envisaged to increase inclusion in PULSE, instead created certain distributions of expertise, valued certain kinds of input, and were not able to accommodate health issues and practices that did not fit into the predefined values and aims of the project. I argue that the project was imbued with institutional values and epistemological traditions, which struggled with the unpredictability, ambiguity and complexity of the participatory process. The formalized formats for participation were especially inadequate regarding the inclusion of underserved users. Rather, participation

emerges in unexpected situations, in processes that cannot be planned ahead or maybe even be seen or valued through the lens of formal participation.

PULSE manifests the inherent tension between the health promotion credo of participation, and its necessarily predefined aims of increasing health measured by specific parameters. A paradox that is not resolved by moving health promotion into the museum field, which harbours a similar juxtaposition between its values of open-ended learning, public engagement and citizenship, and the enactment of specific learning goals and competences by valuing predefined outcomes. I suggest that the health promoting exhibitions, despite their efforts to provide dialogic, open-ended and positively framed health learning, tend to reproduce a knowledge gap approach that does not address the practical and collective efforts to make family life and health workable in the everyday.

Dansk resumé af afhandlingen

Denne afhandling er baseret på en etnologisk undersøgelse af PULS-projektet; et tværfagligt, brugerinddragelsesbaseret projektsamarbejde mellem Steno Diabetes Center Copenhagen og Experimentarium, med det formål at lave en sundhedsfremmende udstilling på Experimentarium og lokale aktiviteter i Københavnsområdet rettet mod familier med børn i alderen 6-12 år. Jeg har som erhvervsph.d.-stipendiat på Steno Diabetes Center deltaget i PULS-projektet og har med en tilgang baseret på Science- and Technology Studies og performativitetsteori studeret PULS som et museumsbaseret sundhedsfremmeprojekt der skaber bestemte virkeligheder og ontologiske normer gennem sit interventionsapparat. Jeg beskriver i afhandlingen, hvordan PULS adresserer, inddrager og problematiserer målgrupperne baseret på et bestemt værdisæt funderet i participatorisk sundhedsfremme og videnskabsformidling. Gennem de muligheder for deltagelse og artikulering af 'de rigtige sundhedsproblemer' som PULS skaber, skabes bestemte, deltagende og sundhedsbevidste sundhedssubjekter, mens andre former for deltagelse og sundhedsudfordringer i hverdagen bliver tilsidesat som uladsiggørlige problemer indenfor de definerede rammer. Især de mindre museumsvante gruppers deltagelsesformer og sundhedsudfordringer er vanskelige at håndtere indenfor projektets foruddefinerede værdier, mål og rammer. Jeg påpeger, hvordan de favoriserede deltagelsesformer indenfor det participatoriske paradigme, som PULS er funderet på, kan skabe utilsigtet udgrænsning af grupper, der ikke allerede er i besiddelse af de kompetencer som paradigmet fordrer, og søger at dyrke. Jeg påpeger, hvordan PULS fik produceret deltagelsesformer og inkluderende tiltag, der ikke var forudset eller del af projektets formelle rammer, og derfor var svært at håndtere og anerkende som værdifulde bidrag. Dermed kan jeg pege på, hvordan projektrammerne for sundhedsfremmende projekter såsom PULS kan skabe indbyggede begrænsninger på grund af deres prædefinerede mål og faglige traditioner. Jeg analyserer i afhandlingen hvordan dette konkret udfolder sig gennem en gennemgang af en række vanskeligheder og 'moments of disconcertment' udløst af projektets møde med en virkelighed der ikke passede ind i projektets rammer.

Jeg beskriver, hvordan codesign-processen i PULS udfordrede forestillinger om autoritet og 'gode input' til designprocessen, og hvordan det kvalitative feltarbejde blandt børnefamilierne viste, at udfordringerne med at leve mere sundt og aktivt i hverdagen sjældent handlede om

mangel på viden og motivation, men snarere var baseret på vanskelighederne ved at afbalancere forskellige praksisser i travle og komplekse hverdagsliv. Jeg argumenterer endvidere for, baseret på en analyse af sundhedsfremmende udstillinger, at der er en tendens til at præsentere sundhed på en måde der primært handler om at gøre den enkelte ansvarlig for og motiveret til at ændre sin egen sundhedstilstand, og dermed artikuleres sundhed primært som en 'logic of choice' i modsætning til de komplekse og kollektive hverdagslivspraksisser, hvor forandring handler om en situeret adressering af helt små og konkrete problemstillinger på en dag til dag basis. Jeg foreslår en reconceptualisering af mindsteenheden for sundhedsfremme baseret på ideen om husholdet; et socio-materielt og praksisbaseret kollektiv, hvor kollektivets vedligehold og koordinering vejer tungere end individers præferencer og ønsker, hvorfor motivations- og adfærdsorienteret sundhedsformidling der skaber mere viden men ikke adresserer hverdagslivets kompleksitet, snarere risikerer at skabe dårlig samvittighed end fremme sundhed.

Part 1

3 A girl from Husum at the Xbus event, Experimentarium

1.1 Introduction

This dissertation investigates the phenomenon of health promoting museums. It is based on an ethnological study of the PULSE[2] project; a health promoting project collaboration between Steno Diabetes Center Copenhagen and the Danish science centre Experimentarium. The motto of PULSE has been "*Have fun living healthily"*[3], reflecting the ambition to provide health promotion that was based on a positive, playful health learning experience in the spirit of the science centre.

The aim of the PULSE project has been to employ participatory and research-based methods to develop a science centre exhibition and community activities that increase physical activity and science centre attendance amongst families of different socio-economic status.

In the winter and spring of 2013, I performed fieldwork in the Copenhagen urban district of Husum and the suburb of Hellerup as part of the PULSE project. The fieldwork was meant to provide target group insights and recruit participants to the participatory development of a science centre-based health promoting exhibition and outreach activities in the two areas.

I performed several interviews in Hellerup, where families were eager to be part of the project; in fact, I had to turn down a number of families, because there were more willing participants than I had the opportunity to accommodate. In Husum, however, the process was painstakingly slow, as I had difficulties getting in contact with families who would talk with me. Weeks went by, and all I achieved was interviews with local professionals, who were telling me how difficult it was to get the residents to participate in anything. The project managers of PULSE were eager to proceed to the design process and to get the target groups involved in codesign. In my research journal, I wrote:

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[2] The name PULSE is not an acronym, but is spelled with capital letters in official project documents. The name reflects the project's focus to increase physical activity: "*PULSE is rhythmical, a beat of the heart, a movement. (…) The name PULSE reflects the exhibition's goals of learning, fun and improving health*" (Stentoft & al, 2012: 1)

[3] The motto, which in Danish goes "*Du bliver sjovt nok sundere*", is a pun on the official Experimentarium motto; "*Du bliver sjovt nok klogere"*.

PART 1

1.1 Introduction

> Still no luck in recruiting participants from Husum, despite the ads, the network approach, and the numerous attempts of the housing association staff and K [volunteer] and M [municipal project worker]. At the moment, there are some discussions amongst the project managers and in the development team whether the ambition to involve Husum should be abandoned, because it is too challenging to create participation. This, however, raises a discussion about the project aims, which stress the inclusion of the underserved users. Can the project build on the Hellerup-families and the Brønshøj-families alone? Do these quite similar and advantaged families qualify as representing 'the underserved users'?
>
> (…)
>
> Conducted an interview with family ZL-H from the Voldparken area in Husum. It came into being credit to M's recruitment efforts. During the interview I realized that [Mother] thought I came from the Area Renewal Secretariat and that the project was about the neighbourhood and housing facilities. Even though I tried to explain my role in PULSE and Steno, and wanted to talk about the development of PULSE and the local activities, they continued talking about the area, its challenges, and how they do not feel safe and would like to be moved elsewhere. It just concerned them more. They described how they had experienced the shootings right outside their apartment, where a man was killed, and others wounded. One of the bullets went through their window, and the police came and investigated at their home, like a crime scene, marking the bullet hole.
>
> *Excerpts from research journal, March, 2013*

These excerpts capture some of the moments of disconcertment I experienced while conducting my PhD-research as part of the PULSE project. The project aim was to design a health promoting exhibition at Experimentarium, and local activities in the two neighbourhoods. Exhibition and activities should engage families with children from the underserved Husum as well as regular visitors from Hellerup, and be based on fieldwork and codesign with these families. It was fundamental that the design process was based on the active involvement of the target groups, and that it engaged with their everyday lives. As the excerpts illustrate, this posed significant challenges, as only a particular kind of families volunteered: the habitual Experimentarium audience from Hellerup. And when I did succeed in getting in contact with

families from the Husum area, they did not behave quite as they were expected to. They '*participated in a different way'*, as one project manager put it in an interview (see **Article 2**). This made me wonder: How do we as health promotion researchers perform health promotion with someone who does not seem to want it? Can a science centre solve this problem? Can the PULSE project base a design process on everyday lives and challenges that do not fit into the format of the project?

The thesis investigates the relations that are enacted between museums and their audiences when museum enter into the field of health promotion. It provides an analysis of how health promotion is performed in practice in a museum setting, and explores the tensions between the participatory values and democratic aspirations of science centres, and the practical enactments of users, health and everyday life in the project.

1.1.1 Museums and health promotion

The field of health promotion continuously seeks to develop new methods to address the complexities of everyday life to increase population health (de Leeuw, 2013; Sparks, 2013, 2014). Health is a pressing global concern, and disease prevention and health promotion take still more focus in public debates, political agendas, and popular discourse. Health today is associated with not only the prevention of disease, but wellbeing, quality of life, and as part of identity-work and social positioning (Green and Tones, 2010). Citizens are continuously called upon by governmental institutions and initiatives to be aware of the risks of unhealthy behaviour, and the benefits of healthy behaviour, and are expected to adjust their lifestyles accordingly (Otto, 1998; Rose, 2007). Health is a public matter of concern, a political, social and personal issue. However, the most prevalent methods for public health communication and health initiatives tend to take an approach either focusing on the population level, or on the individual (Halkier, 2011; Lindsay, 2010; A Mol, 2008). And a large part of this health communication can be criticized for being largely unsuccessful (Walls, Peeters, Proietto, & McNeil, 2011). Most health communication tends to resonate with those that are already interested in health (Grabowski, 2013). There are significant social differences in health status and one of the most prevalent concerns in high-income countries are the social stratifications in health (Diderichsen et al., 2012). Bjarne Bruun Jensen, Head of Steno Health Promotion Research at Steno Diabetes Center Copenhagen and

internationally renowned health promotion scholar, has described that the most central problems to health promotion today are[4]:

1) Lack of ownership amongst target groups, who are often not sufficiently involved in the definition of problems or solutions in relation to their health
2) A medicalised notion of health which emphasizes disease and medical rather than holistic approaches to health
3) An individualizing health discourse which makes the individual responsible and accountable for her own health status – regardless of social, political and structural factors influencing health
4) Lack of context in addressing health issues

The result is the prevalence of top-down approaches that suffer from a disconnect with the everyday lives, challenges and values of the target groups.

Health promotion aspires to address these problems by moving beyond the 'communication' approach, by aiming at building competence and resource and address social, structural and cultural dimensions of health, alongside with providing health education (Green and Tones, 2010). Health promotion aims to build on the experiences, competences and needs of the target groups, and to create impact and relevance by actively involving the target groups in defining action areas and developing solutions (Grabowski, Aagaard-Hansen, Willaing, & Jensen, 2017; Jensen, 1997). Thus the preconditions for 'doing good health promotion' is to actively engage with the everyday lives of the target groups.

In recent years, museums have shown increasing interest in partaking in a health promotion agenda. A number of health promoting exhibitions and initiatives have been launched within the museum field. In the US, hundreds of museums across the nation put focus on physical activity and health as part of the 'Let's Move!' public health campaign commenced in 2010 by former First Lady Michelle Obama[5]. Furthermore, a number of museums in the US have conducted projects, programs and exhibitions about nutrition, physical activity and health (Maher, 2010).

[4] Personal notes from meeting with Bruun Jensen, January 11th, 2018

[5] https://letsmove.obamawhitehouse.archives.gov/

PART 1

1.1 Introduction

Across Europe, museums and science centres have likewise introduced subjects related to health. In the UK, the National Alliance of Museums for Health and Wellbeing[6] organize and support museum health initiatives and gathers numerous case stories of museums initiatives with health and wellbeing aims. Within this growing field of *museums in health*, museums are conceptualized as uniquely capable of creating relevant, interactive and accessible health-related experiences (Chatterjee & Noble, 2013). David Roland, the CEO of the National Health Museum in Atlanta, Georgia, expresses the belief that museums are able to not only reduce the gap between the public and the practice of science, technology, engineering and mathematics (a focus area for science museums and commonly referred to as STEM) and increase science literacy, but also to address the increasing health challenges of 21st century societies by providing a positive focus on health and wellness, rather than sickness and disease (Roland, 2010). Museums, he argues, are poised to contribute to promoting a wellness culture, due to their ability to create fascinating exhibitions and address different learning styles, and helping visitors to develop lifelong fascinations.

Museums, Roland believes, can motivate people to change lifestyle and educate about health from the molecular to societal level (ibid). These arguments suggest that museums have something more to offer to audiences than 'traditional' health approaches, in particular due to their inclusivity in combination with their curatorial practice, which ensures high credibility and quality of knowledge, presented in a value-neutral and unbiased context. Thus, the particular combination of authority and neutrality makes museums suitable health promotion actors.

Museums increasingly experience pressure to prove their impact and relevance by addressing topical issues and satisfying stakeholders (Kotler & Kotler, 2000). There is continuous debate about the social role of museums, and how the museums can and should contribute to social change and be societally useful (Koke & Fraser, 2010; Koster, 1999). Museums are increasingly being conceptualized as drivers for social change, vehicles for the enactment of citizenship, and for the discussion of societal issues (Anderson, 2012; Black, 2012). At the same time, the museums struggle to survive in the light of budget cuts and decreasing visitor numbers. The turn to health promotion can be seen as a consequence of these trends. Thus museums engaging in

[6] https://museumsandwellbeingalliance.wordpress.com/

health promotion seems promising, both as an opportunity for museums to serve societal needs and be relevant, and to develop health promotion with greater impact and wider reach. Some museum genres (such as science museums, science centres and medical museums) have a long history of providing health-related content, with exhibitions about the body, its functions and diseases, and the history of medicine and surgery. However, the specific interventionist agenda of health promotion arguably provides a shift in the role of museums. Health promotion is defined by providing not only education, but to create empowerment, develop skills, and intervene in the organisation of everyday life (Green & Tones, 2010). In this thesis, I approach health from a practice perspective, conceptualising health as performed, situated and socio-materially complex enactments, and investigate how museums through health promotion exhibitions and activities intervene in and engage with the complexity of everyday life.

1.1.2 PULSE: A science centre-based health promotion project

The PULSE project (henceforth PULSE) is one such project where a museum institution encounters the field of health promotion. PULSE is a health promotion project funded with 33 million DKK by the Novo Nordisk Foundation (NNF), running between 2012 and 2019. The project is a collaboration between Danish science centre Experimentarium, and Steno Diabetes Center Copenhagen (Henceforth Steno). The aim of the project has been to develop research-based, innovative, user-involving methods for health promotion in- and outside of the science centre setting, by designing a) an exhibition, b) community activities c) a digital platform or activities (Stentoft, Magnussen, Aagaard-Hansen, & Jensen, 2012). The process has involved target groups from two selected areas; the affluent suburb of Hellerup, and the Husum area in Copenhagen, an area marked by social and health challenges. These areas were appointed to represent both habitual Experimentarium users, as well as underserved users, and to address inequity in health and museum attendance.

The grant from the NNF included funding for two industrial PhDs at Experimentarium (partly financed by the Danish Innovation Fund), and Steno financed an additional industrial PhD (also jointly with the Innovation Fund). I was thus employed as the industrial PhD at Steno, and joined

the PULSE team, which consisted of designers, researchers and managers at Experimentarium, and researchers and research managers from Steno (see also **section 1.2**)[7].
PULSE was, as the project description states, based on principles and methods from health promotion:

> PULSE's [sic] innovative approach to health promotion and prevention is based firmly on specific methodological and theoretical concepts as well as empirical evidence in health promotion research. Consequently, the PULSE project will operate in accordance with a number of selected educational principles, which will be central in the development of the exhibition as well as the associated activities in local communities, including:
>
> - Participation and action competences
> - A broad and positive health concept
> - Multiple approaches for multiple settings
> - Equity in health – reaching new target groups
>
> Science museums such as the Experimentarium are informal spaces, where knowledge building can take place through dialogue between children and parents about science and health issues. As a result, the Experimentarium PULSE exhibition project will function as an action space, where families are inspired to discuss and participate in activities to improve their health.
>
> Achieving sustainable health changes also means addressing the settings in which the families live. To be successful, sustainable healthy changes within a community require the involvement of different stakeholders, including schools, sports organisations, cultural institutions and the local authorities. Furthermore, it is one of the aims of PULSE to use the action competence developed among the participating families at the

[7] I was employed in the project after the grant was awarded, and was therefore not part of the process of writing the project description, but commenced when the project started.

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> Experimentarium to further facilitate health promoting changes in their community settings by involving different local stakeholders.
>
> To address and diminish social inequity, PULSE will make a concerted effort to reach beyond the Experimentarium's traditional categories of visitors, deliberately working to involve socioeconomically less advantaged families in the development of the exhibition and its associated health promotion activities.
>
> Stentoft et al, 2012, 6

The educational principles of *participation, a positive health approach, multiple settings* and *equity* as described as foundational for PULSE are in fact central health promotion values (Grabowski et al, 2017; Green, 2010). In PULSE, these principles are fused with the ambitions to make Experimentarium an action space and place for dialogue, which are typical values of the so-called third generation museums, aiming to generate democratic learning competences and scientific literacy rather than merely providing information (Amodio, 2013). PULSE was inspired by recent US health promoting exhibitions, yet aimed to be innovative in its development of new methods for involving target groups, which, as described, included not only existing users, but also entailed the active participation of underserved users. With this comprehensive agenda, PULSE combined recent tendencies within the museum field, as well as aspiring to address significant challenges within health promotion. As such, PULSE is a case that incorporates the tendencies and development of two disciplines, and therefore provides an opportunity for studying the meeting between them in practice.

Of course, PULSE is also a very specific case. Its constellation of actors and the conditions in which the project unfolded were unique, and yet, the case speaks to larger issues (Geertz, 1973). Thus, the dissertation is not solely a dissertation about PULSE; it is a dissertation about health promoting museums in general, and PULSE in particular. I therefore use my involvement in PULSE as an onset – alongside other health promoting exhibitions in minor roles – to pinpoint to issues, experiences and challenges that can be abstracted to a more general level.

As an industrial PhD I was employed to participate in the development of PULSE as a researcher, to provide and generate research knowledge about health promotion. I study the meeting between health promotion and museum education *through* my engagement in PULSE. I build on this engagement to discuss the implications of the meeting between the fields, in terms of the kind of health promotion engendered by the particular assemblage of actors, values,

disciplinary and institutional trajectories that constitute a museum health promotion venture. The dissertation is a study of the meeting between practices and values of the two fields, and the implications of their joint efforts. How are the aspirations realized? What are the effects?

1.1.3 Intervention and intravention

The dissertation is a result of my employment as an Industrial PhD at Steno, as part of the PULSE project. An industrial PhD is by the Danish Innovation Fund defined as:

> …a three-year industrially focused research project and PhD education which is carried out in collaboration between a company, an Industrial PhD-candidate and a university. (…) The project allows the Industrial PhD to carry out a research project where results are applied in an enterprise setting. The company gets a candidate able to carry out a high quality research project and create results that can lead to commercial gain[8].

As described at the Innovation Fund homepage, the research is embedded in an enterprise setting, imbued with company values, strategies and commercial interests. Steno, however, is a non-profit research institution, wherefore the commercial aspects were of minor importance. Instead, the company requested applicable and company relevant research results. This meant that the research was related to health promotion, and ultimately, generated knowledge that could contribute to the prevention of diabetes. As will be described in further detail in **Chapter 1.2**, research at Steno is shaped by a company strategy that entails a specific set of values and methods. Being part of the PULSE project and employed by Steno, I clearly felt the pull from different directions in the gathering of project partners from different companies and disciplines. At the same time, my enrolment at the University of Copenhagen, and the attachment to the Copenhagen Centre for Health Research in the Humanities (CoRe), consisting of (amongst others) researchers from History and my own discipline, European Ethnology, provided the academic hinterland with ultimately the final say in the assessment of my academic work. This sometimes felt like a precarious balancing act. I thus had to be aware of how this position shaped my research. I strived to conduct a double cultural analysis, which Jespersen et al coin as

[8] https://innovationsfonden.dk/en/application/erhvervsphd

PART 1

1.1 Introduction

'*ethnographies both for and of the involved corporations, business and public and governmental organisations'*(Jespersen, Petersen, Ren, & Sandberg, 2011). My dual role, I felt, entailed an obligation to both produce analyses that might be useful to the project, and also to provide critical analyses of the project, the process, and my position. For me, this was an endeavour to find 'the middle range' as STS scholar and virtual ethnographer Christine Hine describes the attempt to provide results relevant to specific audiences and at the same time being faithful to the complexity and messiness of everyday life (Hine, 2007). The question of usefulness, however, is a tricky one. Does that entail delivering the analyses or results that the corporation or the project expects or would like? Alas, there is no guarantee that science might be useful to the right people – but it might be made usable (Vikkelsø, 2007). Thus I have had to ponder how my research might be made useful, and what kind of contribution I could provide. STS- and humanistic health researcher Teun Zuiderent-Jerak describes the tendency to define social science contributions as finding factors and measures for improvement, arguing that *"this narrow definition of 'usefulness' leaves little space for what is arguably the most productive contribution of a sociology (...): the ability to redefine the problem space (...) by interrogating categories that are taken for granted by other actors"* (Zuiderent-Jerak, 2015, 2).

So rather than provide answers to predefined problems, the contribution of social sciences could be to get involved with discussing the conceptualisations, enactments and values of interventions and 'improvement projects' and the implications for the practices they are directed at (Zuiderent-Jerak, 2015). Cultural analysis can contribute with the study of different ontologies; particular ways of doing the world that have specific consequences for the kinds of action they afford (Zuiderent-Jerak, 2015, 158).

I did not have this agenda of scrutinizing the ontologies enacted by PULSE from the beginning. Rather, it arose through the encounter with several moments of disconcertment (Verran, 2001), which, I later reflected, might stem from frictions between different ontologies produced by PULSE. Some frictions were caused by the clashed between fields, disciplines and professional practices. Others were, at the time of their occurrence, confusing, hard to define and describe, other than a sense of unease, and a feeling that something did not fit.

Admittedly, for a long time, my own sense of contribution was unclear, until I felt that the issue of norms and values enacted by the project became too pertinent for me to let be. So in this dissertation, I take on the questioning and exploration of the project values and goals, and the collateral realities, the onto-norms, subjectivities and collectivities enacted by the project.

PART 1

1.1 Introduction

Following Zuiderent-Jerak, my contribution could be conceptualised as an attempt at *"...reconfiguring the problem space that dominates a certain practice rather than about providing evidence or solutions for pre-defined problem spaces*" (Zuiderent-Jerak, 2015, 9). Such critical engagement can be risky business. Especially in the encounter with project staff that might experience the critical gaze, the stubborn insistence on complexity, and the constant disruption and questioning of existing processes and procedures, as quite a threat to their professional practice. I was not trying to pick apart the foundations of the project or dismiss its good intentions, but rather to engage with the project assumptions to consider and debate their implications. In other words, my engagement was caringly critical. It was performed from within, as a part of the project; a result of critical proximity (Birkbak, Petersen, & Elgaard Jensen, 2015; Latour, 2005). This critical engagement might not provide the kind of contribution that the partners would have liked, or what they found the most useful. It created frictions and tension and probably annoyance. But, the fact that it did, pointed me towards what I thought mattered. Those frictions and ruptures might be significant, and worthy of exploration, rather than to be avoided. Anthropologist and STS scholar Mike Michael describes the overspills, resistance and the unsuccessful attempts as instances that can be learned from, rather than being sanitized and left out of the analyses (Michael, 2012). Instead, such frictions make us stop and reflect upon what we are doing, and whether the overspills of our frameworks should be taken into consideration as important, rather than being dismissed as mere failures. Thus we might learn from failed attempts at participation, from disastrous interviews and the unwanted side-effects of our efforts.

I used my analysis to investigate those frictions, but also to create them, spur discussions or reflections that might change the process. My position emphasized the performativity of ethnographic work: Not only do my ethnographic descriptions enact new realities into being; they are furthermore the base of development and designs that materialize and solidify these realities. The designs are meant as instruments of intervention into everyday lives and health of people. This prompted me to attempt to strategically mobilise my ethnography as an intravention (Jespersen et al, 2011). This conceptualization means that cultural analysis can create agential cuts: Cuts made from within, cutting things apart but also reassembling them in new ways. With this agential and instrumental conceptualization, ethnographic methods become strategic, ontological tools for intravening; creating change from within and bringing forth new (perhaps better) worlds. This enables the researcher to use the reality-making ability of cultural analysis

strategically, to shape and influence practices, and to contribute to the meticulous crafting of specific realities. With this approach, ethnography partakes in the enactment of actors and realities, and is therefore unavoidably political (Winthereik & Verran, 2012). As such I participated in the development of an intervention, while conducting an intravention.
Philosopher of science Helen Verran and anthropologist and STS scholar Brit Ross Winthereik have employed a visual metaphor for ethnography as a kind of gaze that can be shifted and tilted, to show new perspectives (Winthereik & Verran, 2012). In fact, the visual metaphor is frequently employed within cultural analysis: Shedding light, illuminating, illustrating, putting into perspective, employing the ethnographic gaze or glasses. To me the notion does not quite capture the relationality of the process of studying and producing, but rather suggests different perspectives to the same thing. I would rather work towards a more performative conceptualization of the effects of my ethnography and my own presence. Ethnologists Thomas O'dell and Robert Willim (2011) have suggested that ethnographic analysis can be conceptualised as composition, referring to the craftsmanship of assembling and constructing, but, as sociologist Bruno Latour points out, composition, besides its constructivist connotation, also has roots within the world of music – creating harmonies, good or bad (Latour, 2010). Thinking along the acoustic line, I conceptualise my ethnography as working on a particular frequency, probing by sending out sound signals that interfere and interact with their objects, with other signals, and echo back to their sender, creating a situated and momentary knowledge. The frequency can be attuned and adjusted, and thus create particular soundscapes. Thus a frequency creates and resonates, creating dissonance or harmony, disrupts or distorts, creating something new.
This dissertation is the story of how my research took form through the resonance and dissonance that was created in my engagement with PULSE. I have composed the dissertation around the evolvement of engagement through a number of experiences of moments of disconcertment and overspills (Michael, 2012; Verran, 2001); where the goals, values and methods of PULSE encountered frictions, mismatches and awkwardness. These were situations that challenged the intentions and forced a reconsideration of the suitability of the efforts, and a change of course.

1.1.4 Research questions and research aim

In pursuing these questions, I am inspired by approaches from within the field of STS (Science and Technology Studies), and a performative perspective (Jasanoff, 2002, 2004; Knorr-Cetina, 1995; Law, 2004, 2007; Mol, 2002). A common stance within this heterogeneous field is, that collaborations, innovations, and new knowledge do not just come into being because there is a problem 'out there', and then the solution is discovered, also 'out there'(Berg & Akrich, 2004; Oudshoorn & Pinch, 2005). The production of knowledge, technology or design, are processes of meticulous effort, of assembling, fitting, balancing and negotiating. These processes have effects in that they produce not only objects, or facts, or procedures. They produce ontologies, people, norms, and matters of concern (Latour, 2004). Sometimes solutions produce the problems rather than the other way around (Lassen, Bønnelycke, & Otto, 2014). Sometimes interventions are not a matter of producing 'the right solution', but producing something doable within a given set of values, and about the practicalities of making things work (Winther, 2017). And problems can be articulated based on assumptions and agendas, and these have effects for the realities being produced (Mol, 2002; Mol, 2012). Rather than taking problems for granted, and measure the effect and success of the solutions, it can be fruitful to consider the composition of the problem, its solutions, the processes involved in articulating them, and the collateral realities that are produced in this practice (Law, Rupert, & Savage, 2011).

My aim has not been to evaluate PULSE, and whether it meets the established success criteria and makes people healthier (this has been the topic of another PhD-project). Rather, being an STS-inspired ethnologist doing an industrial PhD in a health promotion project, I scrutinize the values, the collateral realities and the onto-normative effects of doing health promotion in a museum setting, by way of the empirical material of PULSE (Law et al., 2011; Mol, 2012). I study the frictions, the overspills and the moments of disconcertment, where things did not quite seem to match (Law & Lin, 2010; Michael, 2012; Verran, 2001).Here, expectations about research, user involvement and participation encountered rationales, practices and everyday practicalities that destabilized the processes and caused me to scrutinize the assumptions and values of PULSE, and of health promoting museums.

My approach to studying PULSE is thus one of investigating the dynamics and processes of PULSE, and the struggles and tensions that arose throughout the project process. They relate, of course to the specific circumstances of PULSE, but I consider them as markers of bigger issues. When working towards fulfilling the aspirations of facilitating inclusion, participation and better

health promotion, PULSE encountered challenges. Collaborative challenges in the cross-disciplinary ambitions and the meeting between fields. Methodological challenges in the participatory design process when working with different users. And institutional challenges in terms of being able to accommodate the serendipities and insecurities of entering new territory – in more than one manner. Based on these experiences the dissertation engages in a discussion of the museum as a health promoting agent. In other words, the thesis considers the implications of the meetings between health promotion and the museum field; for the target groups, the museum institution, and the health promotion that is enacted. I study how the meeting creates frictions in the encounters with target groups, their everyday lives, the translation of scientific knowledge into exhibition design, and the negotiations and collaborations between health promotion researchers and health education designers. I do so based on the following research questions:

- **How is health enacted in a museum context, and, consequently, how is health promotion performed?**
  - **Which norms and values are enacted through museum-based health promotion?**
  - **Which forms of knowledge and authority are enabled through museum-based health promotion?**
  - **How are participation and inclusion articulated and performed?**

- **What are the implications of health promotion being carried out in a museum context, for:**
  - **The health messages that are communicated?**
  - **The role and position of the museum?**

How I have come to these research questions, and their theoretical underpinnings, will be elaborated in the following sections of **Part 1**, where I account for my position, scientific approach and analytical apparatus, before I provide the account of how the research questions were operationalized in **Part 2** of the thesis.

1.1.5 Outline of the dissertation

The dissertation is structured as follows:

PART 1

Here I recount the background for the project, the literature on which I draw, my theoretical approach, and my position as an Industrial PhD with an ethnological background in a collaborative health promotion project.

1.2 The PULSE project is the description of the PULSE project constellation; the project aims and the partners of the collaboration; in other words, the preconditions and actors shaping *the projectness* of the project (Langstrup, 2011).

1.3 Literature study sets the scene for the discussion of health promoting exhibitions, by introducing the disciplines of health promotion and museum education, and the meeting between the two disciplines in the turn towards museums in health, where museums are articulated as promising settings for health promotion. I draw out the related sets of values and challenges within both disciplines, to discuss the implications of museums venturing into health promotion, and whether this move is in line with, or in potential juxtaposition with, the participatory and democratic aspirations that are attributed to the '21st century museum'.

1.4 Science, health and the social is a recount of the theoretical background and analytical approaches of the dissertation, which is founded on a Science and Technology Studies perspective and drawing on analytical approaches from post-ANT or performativity. Hereby I conceptualize of the project as a socio-material apparatus of intervention where health promotion is developed, health displayed, and target groups enabled to participate in the project in certain ways. This process of enacting specific problems, target groups and solutions has the effect of producing specific ontologies. In the chapter, I furthermore recount how my background in Ethnology provides me with an interest in the dynamics and structures of everyday, and how I draw on Practice Theory to conceptualize the socio-material heterogeneity and interrelatedness of stability and change of everyday life as the entanglements of practices. Hereby I pose an engagement with the situated complexity of the everyday life where and when it is performed, as a prerequisite of intervention.

PART 1

1.1 Introduction

PART 2

In the second part of the thesis, I account for my trajectory of inquiry and the analytical cuts as effects of the moments of disconcertment and overspills I encountered in the course of my engagement with PULSE. I recount how these experiences of rupture and mismatch shaped my research interests and resulted in the analyses that are presented in the articles.

2.1 Methods, disconcertment and overspills contains the compiled description of the fieldwork, methods and empirical material that forms the empirical basis for the dissertation. In it I discuss the relations between the theoretical approach and the methods employed in my research, describing the mutually constitutive relation between theory, methods, analysis and empirical field, and how I by employing a performative and situated approach was able to follow the tensions, mismatches and moments of disconcertment that the PULSE project and my research endeavour evoked, studying the realities that were produced through these efforts.

2.2 Health practices and household collectives is a discussion of the part of my fieldwork that took place in Hellerup, predominantly with the Experimentarium habitués and socio-economically advantaged families. The fieldwork raised the analytical theme of *collectivity* and the orchestration of multiple and entangled *household practices,* as the families described the everyday family and health practices and the struggles to balance physical activity, family life and careers. In the chapter I discuss how the families' willingness to let themselves be problematized in a certain manner raised questions regarding the relations, goals and values enacted by the project.

2.3 'Good' and 'bad' participation? deals with the inherent scriptedness and normativity of the PULSE project, and relates this to the participatory paradigm within education. I recount the challenges and paradoxes produced by the kind of participation that was enacted by the PULSE project. This discussion is primarily based on the part of the fieldwork that dealt with facilitating participation and inclusion amongst the underserved groups, i.e. the residents from the Husum neighbourhood, and engages with the different problem complexes, modes of participating and performing citizenship and community that were enacted by the two different target groups. With a point of departure in the challenges of recruiting participants from the underserved area, I

engage in a discussion of how the PULSE project *afforded certain modes of participation*, thus inadvertently enacting preferred forms of participation and of being a visitor.

2.4 Codesigning health promotion concerns the PULSE codesign process' enactment of certain forms of expertise, knowledge and input as more usable than others, discussing how, due to the institutional and disciplinary framework of the project, the co-process did not open up for just anything: Some problems and some kind of knowledge were discarded as they are not 'usable knowledge' and 'doable problems' (Lassen et al, 2015). I address the challenges the project encountered when transposing situated, ethnological analyses into designable issues, and the paradox of addressing complex everyday lives and practices within a predefined project framework.

2.5 Health promoting exhibitions: ontonorms, authority and socio-scientific issues contains my engagement with the dilemmas of situating health promotion in a museum setting, focusing on the ambitions to create positive health experiences and communicate a broad and wellbeing-oriented notion of health. I employ Dutch philosopher Annemarie Mol's concepts of ontonorms (2012) to discuss how the health promoting exhibitions enact specific subjectivities, versions of the good, healthy life, and authoritative communication, thus counteracting the recent turn in museums towards open-ended meaning-making and discussions of socio-scientific issues.

2.6 Consists of the 4 articles of the dissertation:

Article 1: **Household Collectives, Resituating Health Promotion and Physical Activity**, submitted to *Sociology of Health and Illness*, is co-authored with Catharina Thiel Sandholdt and Astrid Pernille Jespersen. It is based on the fieldwork conducted with the target groups of PULSE. In this article, we describe the complex and interdependent everyday practices of the families, where the collective may take precedence over individual preferences, and individual behaviour has collective implications. We describe the socio-material assemblages of actors, values and processes that are gathered and kept together by meticulous work of coordinating, managing practicalities and distributing roles and responsibilities in the families, which are better conceptualized as household collectives. Thus rather than addressing individuals within families,

we suggest that health promotion needs to engage with the practical management of collectives in the everyday life.

Article 2: '*Well, they kind of participated in a different way'*. Modes of Participation at the Science Centre, recounts the inclusion and participation activities in PULSE. The article engages with the prevalent conceptualizations of participation which tend to favour discourse and formalised, creative exercises over bodily, material or caring modes of engagement. In the article I argue that this approach risks enforcing mechanisms of exclusion rather than mitigating them, especially when working with underserved groups. I introduce the notion of *modes of participation*, to illuminate how different participatory setups afford and recognize specific modes of participation, while failing to acknowledge modes that do not fit into existing frameworks of participation. I analyse how PULSE afforded the enactment of participation in subtle, chaotic, material and bodily modes, and suggest a broadening of the notion of participation to appreciate different modes of participation, and thus recognizing that the inclusion of underserved users perhaps needs to be framed and valued.

Article 3: Codesigning Health Promotion at the Science Centre: Distributing Expertise and granting Modes of Participation, published in *CoDesign*, is co-authored with Catharina Thiel Sandholdt and Astrid Pernille Jespersen. In the article, we engage with the codesign process of PULSE, and the complexities of translating user experience into exhibition design. The codesign process was shaped by the meeting between the fields of health promotion research and exhibition design practice. We describe how audiences and professionals were redefined and repositioned, and how tensions arose and necessitated negotiations of expertise, authority and modes of participation. Rather than constituting all participants as equal contributors to the design process, the methods created a distributed landscape of expertise, casting the participants as experts in some areas, and closing down the opportunities for exerting influence in other areas. Thus the codesign process made certain kinds of input and participation usable and doable at certain stages.

Article 4: Health, Fun and Ontonorm: Museums promoting health and physical activity, is co-authored with Dan Grabowski, Julie Hellesøe Christensen, Peter Bentsen and Astrid Pernille Jespersen. We provide an analysis of three health promoting museum exhibitions, and show how

their approaches to health oscillate between authoritative advice and dialogue, and how the way they conceptualise health and the target groups has the implication of producing ontological norms and specific subjectivities. We argue that there are inherent paradoxes in the ambition of promoting health in a playful and dialogic manner, where a seemingly open-ended and participatory approach tends to conceal normativities and a limited range of acceptable answers and positions. Thus we conclude that the transfer of health promotion into the domain of museums does not necessarily solve the problems of health promotion, but produce new dilemmas regarding authority, normativity and responsibility, which the museums need to consider when venturing into the field of health promotion.

2.7 Concluding discussions is where I sum up and discuss the dissertation, drawing together the articles and the sections of the dissertation into the four main areas of discussion that my dissertation contributes to; the themes of *enacting 'the right' health problems*, *addressing the complexities of everyday life, scripting participation*, and *the role of the health promoting museum*. These themes represent challenges that arose from PULSE, but are relevant and pertinent to the disciplines of health promotion and museum education as well as humanistic health research within Ethnology, as these disciplines all engage with how to involve and engage with everyday lives in the generation and application of scientific knowledge. I conclude by suggesting two directions for museum-based health promotion; one that allies with present health authorities in communicating recommendations and provide more knowledge and motivation about health, thus positioning health museums as authorities who communicate and recommend specific lifestyles; or one in line with the ambitions to make museums fora for discussions of socio-scientific issues, where the museums can facilitate dialogue and exploration of the meanings and values of health, and thus contribute to the development of situated health promotion.

Appendices

Appendix 1 contains my 5th article, ***Museums and science centres for health: from scientific literacy to health promotion*****,** written together with Julie Hellesøe Christensen, Lærke Mygind Grønfeldt and Peter Bentsen. The article presents a scoping study of written material from 18 health promoting exhibitions at museums and science centres, assessing and discussing their

design and purpose, health concepts, and results and evaluations. In the article, we discuss the challenges inherent in museums taking a health promotion approach, particularly in relation to evaluation of health-related outcomes, and conclude that the health promotion potentials of exhibitions can be increased through building on a broader notion of health including empowerment and equity, and increasing community synergies.

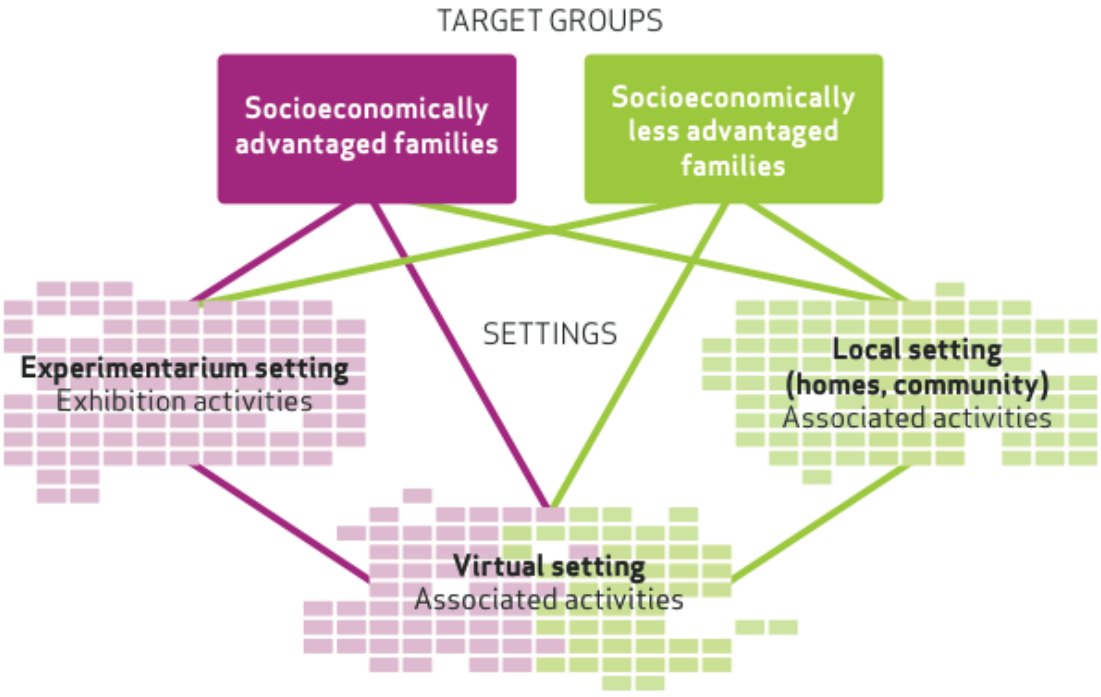
Appendix 2 is a list of the empirical material of the dissertation.

1.2 The PULSE project

In this chapter I will describe the project constellation and the aims of the PULSE project. This is of significance to my analyses, because they not only form the context and part of the empirical material of my research, but also because the project composition shapes the projectness of the project. The notion of projectness describes a certain kind of logic, a favoured mode of ordering, where science, technology or health are performed in a manner that shapes and interpellates the target group in a specific way (Langstrup, 2011; Law, 2002; Law and Singleton, 2000). Thus the aims as negotiated and defined by the project actors perform a certain mode of ordering, implying that certain methods and criteria be employed in the conduct of PULSE.

1.2.1 The aims of PULSE

The aim of PULSE was to involve families of both socioeconomically advantaged and disadvantaged backgrounds in the development health promoting concepts at the Experimentarium, as well is in the local communities and in a virtual setting.



PULSE focus areas (Stentoft et al, 2012, 7)

1.2 The PULSE project

The project description of PULSE states the aims and success criteria of the project. It was written jointly by project managers from the two project partners; Steno Diabetes Center and Experimentarium (Stentoft et al, 2012). The expected collaboration outcomes were the development of a methodological model for guiding future research-based exhibition collaborations, to develop a research department at Experimentarium, and to rise additional funding to a continuance of the project. The main outcome for Steno, as a research institution, was the production of peer-reviewed publications and research dissemination. The goal was 20 peer-reviewed publications, 20 conference presentations, 2 anthologies produced, and 2 PhDs[9], one Post Doc and 5 Masters completed, this amount shared between both institutions. This assemblage of aims and success criteria shaped the project, and posed certain difficulties, as the aims were interpreted and valued differently by the different disciplines and professions present in the project. I will return to these challenges in the sections of **Part Two**.

The PULSE remit furthermore states that the research in PULSE is to create:

> ...new methods and theoretical models for the design of interactive exhibitions that create behaviour-changing experiences in relation to health and lifestyle. It is central that the research contribution secures, that these methods can be implemented in practice in future exhibition projects and associated activities at science centres. PULSE is thus to serve as a national and international landmark for how science centre exhibitions about health can inspire both affluent and socially disadvantaged families to improve their health.
>
> (Busch et al, 2012, 2, My translation)

Here it is expressed that the outcomes of PULSE are conceptualized as being of international relevance, and thus that the specificities of PULSE has larger applicability. The expectation is expressed that the models and methods can be generic, and their effectiveness demonstrable. What featured most prominently in the project description were the aims of creating changes in target group health behaviour:

[9] My PhD was not part of the grant application, but was added to the project later.

Success criteria for the exhibition and associated activities

• 60% of the families taking part in the PULSE exhibition for more than 20 minutes will state that conversations have taken place in the family about health (e.g. physical activity, quality of life) during their visit.

• An average rating of at least 5.4 from families taking part in the PULSE exhibition for more than 20 minutes who rate its relevance to their everyday lives on a scale from 1-7 where 1 is 'not relevant at all'; 4 is 'somewhat relevant; and 7 is 'very relevant').

• An average rating of at least 5.9 from families taking part in the PULSE exhibition for more than 20 minutes who rate its entertainment value on a scale from 1 – 7 (where 1 is 'not entertaining at all'; 4 is 'relatively entertaining'; and 7 is 'very entertaining').

• An average rating of at least 5.3 from families taking part in the PULSE exhibition for more than 20 minutes who rate its educational value on a scale from 1 – 7 (where 1 is 'not educational at all'; 4 is 'relatively educational'; and 7 is 'very educational').

• The number of socioeconomically less advantaged families visiting the exhibition will correspond to at least 10,000 visitors per year.

• 30% of the families who have visited the PULSE exhibition subsequently make use of the associated activities in relation to their personal website.

• 15% of the families who have visited the PULSE exhibition subsequently make use of the associated activities in relation to the exhibition website.

• The number of visitors on the PULSE exhibition website is at least 180,000 per year.

• 40% of the families visiting the Experimentarium exhibition increased their knowledge about health after visiting the exhibition.

• 20% of the families increased their knowledge about health 3 months after visiting the exhibition.

• At least 1000 people use the physical activities in the two community settings annually.

• At least 200 families decide to visit the Experimentarium annually due to exposure to the physical activities in the two community settings.

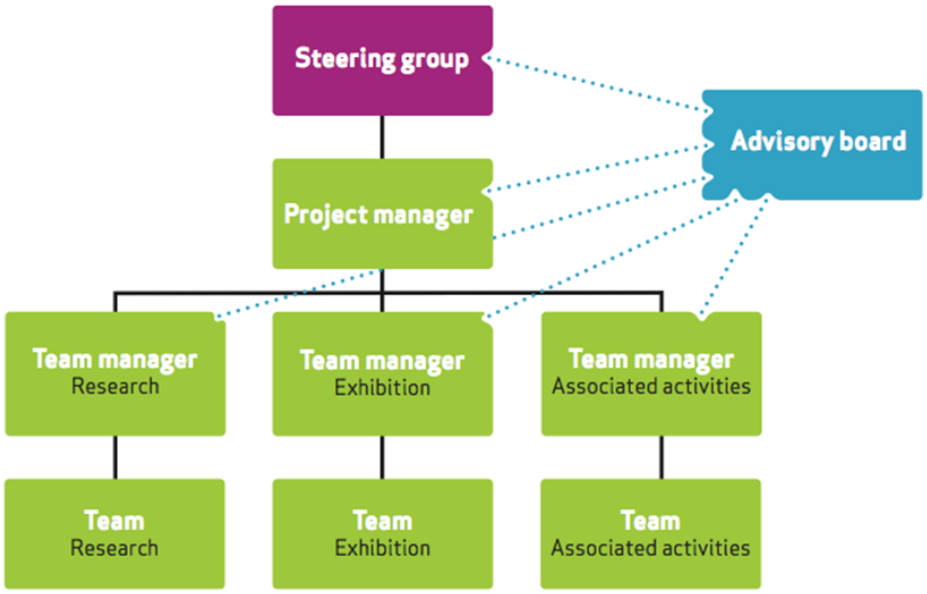
> • At least 400 people make use of the exhibition website annually after exposure to the physical activities in the two community settings.
> • An increase in physical activity by 30% of the participating PULSE families 1 month after implementation of associated activities.
> • An increase in physical activity by 15% of the participating PULSE families 3 months after implementation of associated activities.
>
> (Stentoft et al, 2012, 43-44)

With these outcome definitions, the project strived to achieve measurable and comparable results and generic models. These targets were very specific and represent a mix between the habitual outcome measures of Experimentarium, which are numbers of visitors, and learning outcomes measured at the exit, evaluating the relevance, educational and entertainment values, and classical health behaviour measures, such as the increase in physical activity levels.
Having articulated specific goals and definitions of health that were to be achieved, the project thus needed to produce an intervention that could deliver these results. The user involvement would consequently be a kind of user involvement that could support the delivery of these targets, rather than explore which concerns were the most pressing for the target groups in question. In fact, the target groups were being appointed due to the strategic collaboration with the municipalities of Copenhagen and Gentofte, who appointed particular areas of interest to intervene in (especially the Voldparken area of Husum).
The expectation to the collaboration between researchers and designers was that the researchers would build bridge between the everyday life of the target groups and the science centre by providing research that would let the designers know what the users wanted and needed. Furthermore, the researchers were to provide the health research base for the project. There was thus a certain expectation that the researchers would let the designers know ‘what works’, and then the designers could creatively translate this into design. Designers expressed wishes to work with concepts such as ‘nudging’ and ‘experience design’ to provide the transformative experiences that would motivate and inspire the visitors to change their lifestyle.
Even though the professed a broad notion of health, the success parameters were rather specific and narrowly defined. This inherent paradox in the project description later came to pose problems for the project, as issues arose that the project was not able to address, and the participatory process disclosed a mismatch between intentions and methods. The project enacted

'doable problems' (Lassen et al, 2015); issues that would help achieve the aims of the project, and fit with the approaches that were of value to the partners. In Part 2 of the dissertation I will venture into more detail on the practical work with implementing the values and goals of PULSE, and discuss the challenges and reconceptualisations that arose from working in the empirical setting.

1.2.2 The partnership and organizational structure

The PULSE team was divided into Exhibition development and Associated Activities, the latter responsible for the development of local and virtual activities, which at the onset of the project were not further specified. There were three industrial PhD's associated with the project; Catharina Thiel Sandholdt, Lena Thulstrup Jensen and myself. Catharina Thiel Sandholdt (Henceforth CTS) was mainly working with the process of codesigning the exhibition. Lena Thulstrup Jensen was employed to develop an evaluation framework. I was mainly focusing on the inclusion and participation of underserved groups, which in practice meant working with the Husum residents. As there were large common areas of interest between CTS and myself, we jointly conducted the fieldwork in Hellerup and with the first recruited Husum-Brønshøj families. In the later project stages, where the development processes of the exhibition and the Associated Activities diverged, so did our research activities. We therefore have a substantial amount of shared data, co-analyses, and shared publications.



PULSE project structure as depicted in the project description (Stentoft et al, 2012, 7)

1.2.2.1 Steno Diabetes Center Copenhagen

Steno Diabetes Center Copenhagen is a non-profit diabetes research hospital, with research units that work with the prevention, treatment, management and complications of diabetes types 1 and 2, and patient and health professional education. I was affiliated with the Health Promotion Research department (SHPR). At the onset of the project, Steno Diabetes Center A/S, as it were, was a Novo Nordic subsidiary company, but has now been transferred to the Danish Capital Region (Region Hovedstaden). Most of the researchers from the department come from a background in public health or social sciences, health promotion or health communication. The Steno staff from SHPR participating in PULSE was a team manager with a background in Sports Science, Psychology and Outdoor Education, a number of student assistants and master students, and myself.

Being formulated by researchers from Steno in collaboration with Experimentarium staff, the PULSE project was highly influenced by the values and approaches to health promotion as employed at Steno. Steno works with five health promotion principles based on values from health education and the Ottawa Charter (Grabowski, Aagaard-Hansen, Willaing, & Jensen, 2017; WHO, 1986).

The five principles are:

1) A broad and positive notion of health
2) Participation and involvement
3) Development of action competence
4) A settings perspective
5) Equity in health

Ad 1) Basing health promotion on a broad and positive notion of health stems from the WHO definition of health as "*a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity*."(WHO, 1946/48) At SHPR this means working with multiple ways of experiencing and expressing health, and addressing different health identities, practices and aspirations through educational design.

Ad 2) Participation is the most important dimension of the health promotion approach employed by SHPR (Grabowski et al., 2017). Drawing on educational theory, the approach is to involve stakeholders and intended target groups in the development of methods and tools to promote

health, in order to promote action competence. Having the participants develop a sense of ownership and influence over the learning process is a prerequisite for the notion of democratic education employed by SHPR (Jensen, 1997; Simovska, 2007). As such, this approach assumes a direct connection between action competence, participation and democracy. As the dynamics and implications of participation are of particular interest to this thesis, I will return to this in the following chapters.

Ad 3) Action competence is defined as the ability to take action towards change, and can apply to both individual and collective action. It furthermore applies to both direct and indirect forms of action, thereby seeking to address both individual and social/structural conditions for health.

Ad 4) Applying a settings perspective means to approach health as it unfolds in the different arenas of everyday life, and seeking to address factors influencing health on many levels; both personal, social and structural.

Ad 5) Lastly, SHPR emphasizes addressing inequities in health, working with the different conditions, experiences, challenges and resources that create inequity in health, with a particular emphasis on vulnerable groups.

These values permeate all the research and development work performed at SHPR, and also provided the backbone for the formulation of PULSE and its aims and aspirations. The research is practice-oriented, building on practice, and directed at practice. There is consequently significant focus on the feasibility, implementation, evaluation and reproducibility of the research and interventions conducted at SHPR.

Furthermore, as SHPR is largely dependent on external funding, there is an ongoing strategic work taking place to define and position SHPR in the health promotion landscape, and to develop terms and approaches that encompass the values of SHPR and health promotion, while supporting a viable mode of existing for SHPR by ensuring continuous grants. SHPR is thus suspended between conducting research that adheres to the values of broad and positive health and participatory approaches, all the while providing clear and specific research goals, and ensuring measurable impact and deliverables. The PULSE project reflects this precarious balancing work: Describing broad, positive and participatory aims, yet with success criteria that are largely pre-defined and formulated as specific and measurable outcomes.

PULSE is thus also a materialization of the values and the dilemmas of health promotion as performed at SHPR. The values were pre-given and highly influential, shaping the approaches,

success criteria and methods adopted by PULSE. At the same time, the specific outcome definitions created significant challenges. Their looming over the project raised for me a need to critically reflect on the implication of their presence as defining values – how were these values being performed in PULSE, what was the implications and challenges of being equipped with them? This spurred me to not only partake in the development process in PULSE, and deliver research into the design of health promoting methods, but also study the application and implementation of health promotion into a different arena, with values and principles of its own. The ambition to foster participation as a prerequisite for health promotion and science learning – the convergence of values in both fields pointed to the notion of participation as crucial for the understanding of PULSE, its ambitions and challenges. Therefore, in my approach to PULSE, these values became particular points of attention, forming my analytical focus. What kinds of methods for health promotion did PULSE perform? What were their collateral realities, and which onto-norms were enacted in this kind of health promotion? I will return to these questions and their theoretical underpinnings in Chapter 1.4.

1.2.2.2 Experimentarium

Experimentarium is a science centre located in Hellerup, a Copenhagen suburb. It is a non-profit commercial foundation for the dissemination of science and modern technology, with the aim to promote interest in science and technology, increase qualifications for independent assessments of the management of culture and technology, and create a social and cultural meeting place, where visitors, irrespective of background, can have fun and educational experiences (Experimentarium Strategy (internal document)). The science centre boasts three stories of interactive exhibitions on scientific phenomena, technology and biology, such as inventions, the body, means of transportation, light and weather. It offers opportunities for tinkering, splashing, using the body and brain, and goes by the motto "*Du bliver sjovt nok klogere*", which roughly translates to "*Have fun getting smarter*". Experimentarium likens itself nationally with technical and science museums, and internationally with science centres and science museums. Experimentarium takes significant inspiration from the 'original' science centre; the Exploratorium in San Francisco. The name both resembles that of the Exploratorium and refers to Experimentarium being "*a house of experimentation*" (Høeg, 1989). The learning approach is largely constructivist. The visitors are to learn via playing, exploring, experimenting, and the science centre aims to facilitate an active and independent meaning-making process. The hands-on exhibitions are supplemented with questions encouraging reflection on the phenomena –

along with the correct answers. Thus the learning approach of Experimentarium is also influenced by a positivist and evidence-based tradition, with correct and incorrect answers. In science museums it is common that the visitors are to learn the right use of the exhibits and translate the experiences into scientific and technical knowledge (Simonsen, 2016). Thus there is 'a truth' to be acknowledged, by means of supported meaning-making.

> "Have fun getting smarter" [The Experimentarium motto] thus refers to a personal Eureka-moment, where the visitor has a good time – and suddenly makes realizations. A science centre is thus positioned between a constructivist and a positivist learning tradition (Simonsen, 2016, 40, my translation).

Experimentarium creative staff is a mix of educated designers and developers, predominantly with backgrounds in natural sciences[10]. The group of Experimentarium staff that participated in PULSE varied in composition and size through the lifespan of the project, but the project managers remained; one with a background in Biology, one with a background in Architecture, and the teams consisting of a couple of designers, the PhD's, and for a period of time a Post Doc with a background in Biology, a shifting number of master students, and occasional consultants within design, digital development and more.

The approach in PULSE was new to Experimentarium in many ways. The aim to create research-based knowledge and dissemination was different from the habitual communication of existing scientific knowledge and practices, and it was not decided beforehand how the collaboration between researchers and designers should unfold, and how the research should be translated into design. Likewise the participatory approach and aim was radically different from previous design practice, which had primarily centred on classic technical testing. Users had hitherto primarily been involved as testers or consultants within very specific frameworks, providing responses to presented ideas and prototypes. The ambition to create outreach and involve underserved users was likewise relatively new.

[10] At Experimentarium distinguished between as 'designere' [designers] and 'udviklere' [developers]; but in this thesis indiscriminately referred to as 'designers'

1.2.3 Summary: The projectness of PULSE

I have recounted the project constellation with the actors and success criteria of PULSE. The account of these actors in PULSE is important, because they constitute the projectness of PULSE (Langstrup, 2011). The specific constellation of different stakeholders from certain fields, with their specific conceptualisations of valuable approaches, outcomes and methods shaped the project and created the frictions and challenges I recount in this dissertation. They are at once specific for this project, yet despite their specificity, I argue, address larger issues within the field of museum-based health promotion. They draw on certain disciplinary tools, epistemologies and ontologies, and incorporate them in the performance of health promotion in a certain version in PULSE, as I will unfold in the following parts of the thesis. In the next chapter I will engage with the literature within the respective disciplines, to draw out some of the discussions and challenges that are of significance to PULSE, and which PULSE has sought to address.

1.3 Literature study

In section 1.2 I described PULSE and its aims and approach, being founded on health promotion values and methods and placed in a museum setting. PULSE articulated expectations that situating health promotion in a museum setting would provide a particularly beneficial approach for promoting health. This expectation is not unique; rather, the rising field of museums in health explicitly posits the museums as a powerful and promising health actor, as I will describe in the following.

In section 1.2 I also introduced the two main actors in PULSE; Steno Diabetes Center and Experimentarium. Each stems from a disciplinary tradition influencing their approach, aims and epistemological norms in promoting health, and in this chapter, I will approach literature from both disciplines that discuss some of the issues most pertinent when engaging with health promotion. In my reading, the principles of participation and inclusion stand out as common focal points within both disciplines. The prominence of these values can be ascribed to the larger 'dialogic turn' (Phillips, 2011) in the production and communication of knowledge, which poses participation as a prerequisite for democratic and inclusive learning. Thus close connections are established between democracy and the involvement of the target groups in the production of knowledge and communication about health, and in the framing of health as a socio-scientific issue; that is, more than an objectively definable, researchable and communicable phenomenon. However, the implementation of participatory principles has in both fields posed challenges and paradoxes in the encounter between values of democratic sharing of power and authority, and the epistemological and institutional frameworks of both disciplines.

I will first introduce health promotion and then proceed to a reading of museum and science centre literature, which includes the burgeoning genre of museums in health. In my reading of the health promotion literature, I draw out the fundamental tenets for health promotion, to engage with the dilemmas they pose when applied in practice, and to discuss how museums address these dilemmas. The focus I have when reading the literature is inevitably shaped by a) my background in Ethnology and my theoretical foundation within STS, which lends me a particular interest in the complexity and dynamics of everyday life, and a performative perspective on science, epistemology and ontology, (see **chapter 1.4** for an elaboration) and b) the discussions and practical challenges I experienced when working at Steno, where a great deal of efforts were invested in defining and managing health promotion principles alongside

practical implementation of institutional frameworks, in working with practice and real life experiences of health and everyday life.

1.3.1 Health promotion

In this section, I will go through the health promotion literature to seek out these central tenets of health promotion, to relate the significant discussions and challenges they are associated with. A classic definition of health promotion is based on the Ottawa Charter definition from 1986:

> Health promotion is the process of enabling people to increase control over, and to Improve, their health. To reach a state of complete physical, mental and social wellbeing, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy lifestyles to wellbeing.
>
> WHO, 1986, 1

Health promotion[11] is a very comprehensive and diverse field, encompassing numerous different focus areas and methods (Dawson and Grill, 2012, Green and Tones, 2010). The Ottawa Charter, as quoted above, is often considered one of the cornerstones of health promotion, with its broad and globally oriented definition of the values, focal areas and goals for promoting global health. The charter reflects health promotion's variety of target groups, spanning from individual to community, institutional and policy levels, and aims and types of interventions vary accordingly. Definitions of 'health' can, as expressed in the Ottawa Charter, take cognitive, mental, physical

[11] A note on my employment of the definition of health promotion: Some distinguish between health promotion (HP) and health education (HE) on the terms that HE is concerned with the communication of information, where the goal is the achievement of health literacy, alongside the building of action competence, whereas HP can be considered health education + advocacy (Green and Tones, 2010, WHO, 1998). In practice, the distinctions between HP and HE is not always so clear, and health promotion is often used for both kinds of activities. In Steno, for instance, HP and HE are used interchangeably, and the PULSE project should strictly speaking be defined as a HE project, as it was not concerned with structural changes or advocacy, but was generally introduced as a HP project.

and social aspects, and health promotion can in practice span from primary, secondary or tertiary prevention, to the promotion of happiness and wellbeing (Breslow, 1999).
While the practical applications of the Ottawa Charter vary, the values of the Charter permeate almost all local definitions of health promotion. Some basic tenets are most frequently mobilized, which I characterize as:

- A broad and positive notion of health
- A participatory approach
- Interventions in everyday life

1.3.1.1 The critique of behavioural approaches: a broad and positive notion of health

Health promotion is often defined in contrast to biomedical health discourses and behaviourism (Green and Tones, 2010, Jensen, 1997). The concept of health behaviour is widespread and popular amongst policy makers and within some areas of public health research and intervention studies. A prominent example within a Danish context is the Danish Ministry of Health's framing of the KRAM factors – comprising diet, smoking, alcohol and exercise – as significant focus areas for prevention (SIF 2008). The KRAM factors have provided the point of departure for numerous health interventions and campaigns to alter behaviour. It has been commonly accepted that such health factors can be defined, isolated and targeted as health behaviours to prevent lifestyle diseases (Cohn, 2014). This conceptualization of health as consisting of disparate kinds of health behaviour has been thoroughly criticized by scholars within critical public health research and the social sciences. Medical Anthropologist Simon Cohn recounts the connection of health behaviour to a biomedical distinction between inherently beneficial and detrimental health behaviour: The notion that some kinds of behaviour are per definition good, and others bad. Consequently, behavioural approach tends to emphasize negative health behaviour such as sedentary lifestyle, bad eating habits, etc. In this framing, behaviour becomes detached from the actual practices of everyday life, and is no longer regarded in its context, to the neglect of social, cultural and power-related aspects of health (Cohn, 2014). Health becomes reduced to "*discrete, stable, homogeneous and measurable*", behaviours of individuals (Cohn, 2014, 156). The behaviourist approach tends to be fused with a knowledge-gap assumption, which poses unhealthy behaviour as the result of lack of knowledge. Within this line of thinking, more information about risk behaviour and its consequences will increase motivation and thus spur behavioural change. Many health communication and public health approaches still work from such a knowledge gap approach, despite evidence for its lack of efficiency (Walls, Peeters,

Proietto, & McNeil, 2011). Furthermore, this individualizing approach tends to support neoliberal governance and responsibilisation (Cohn, 2014). With their seminal work within the field, Green and Tones describe that health promotion developed as a dissociation from previous, deficit-based approaches to health education which "*had become associated with attempts to persuade individuals to change their behaviour and was criticized for failing to take account of the wider influences and, therefore, being victim-blaming in orientation.*" (Green and Tones, 2010, XXI-XXII). In contrast, contemporary health promotion emphasizes positive, democratic and holistic approaches to health (See e.g. Dawson and Grill, 2012, Jensen, 1997, Green and Tones, 2010). This means that focus is moved away from disease and risk, and towards health and the mobilisation of resources and competences (Sundhedsstyrelsen, 2005).

Health promotion aims to empower people to change their lifestyle and wellbeing by increasing awareness and knowledge over the factors that influence health and wellbeing, and supporting the development of competences and resources to control these factors (Bloch et al., 2014; Green and Tones, 2010; Grabowski et al., 2017). At Steno, the notion of *action competence* is often used to encompass the combination of skills, knowledge and motivation that defines the ability and willingness to act (Grabowski, 2003). Important components of action competence are the development of learning skills such as the ability to cooperate, read and make oneself clear, along with the development of knowledge, visions and critical thinking and decision-making skills (Simovska & Carlsson, 2012, Jensen, 1997). Likewise the notion of *health literacy* has been proposed to describe skills critical for developing a sense of empowerment. Nutbeam defines health literacy as "*the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health*" (Nutbeam, 1998: 357). Both approaches concern the acquisition and appropriation of health-related knowledge, and the experience of ability to change. However, increasing empowerment understood as the knowledge and ability to act, does not guarantee a change in behaviour, and measures of success only indicate whether the ability or intentions to change have been increased. Knowledge and intentions alone do not necessarily lead to behaviour change (Green and Tones 2010; Nutbeam 2000; Lindsay 2010), and there is still a significant gap between knowledge and action. Thus remains a challenge and missing link for health promotion (Grabowski, 2013).

1.3.1.2 Participation and empowerment

Crucially, within the broad and positive approach to health, health is also conceptualized as the individual experience of meaningfulness and coherence (Sundhedsstyrelsen, 2005). This requires the involvement of the target groups. Participation in the different stages of health promotion activities is thus considered a prerequisite for health promotion (Jensen, 1997). Participation comes in numerous forms and degrees, spanning from simple dialogue, to interactive exercises and role-plays, to action research, but the basic principle can be conceived as interactive learning (Green and Tones, 2010). Often within health promotion participation is defined as taking part and being granted influence over the process and content of learning, and sharing power in decision-making (Simovska, 2007).The active involvement of the target groups in the definition and development of solutions is to increase sense of ownership, relevance and empowerment (Jensen, 1997).

The notion of participation has spurred numerous debates regarding the quality and quantity of participation, its legitimacy and purpose (see Reid, Jensen, Nikel, & Simovska, 2008). In 1969 the renowned American health policy specialist Sherry Arnstein proposed a model for citizen participation which linked participation with power and conceptualized citizen engagement as a ladder with eight steps, spanning from non-participation over tokenism to citizen power (Arnstein, 1969, Simovska 2004, 2007). This often-used model, or American sociologist and child-rights scholar Roger Hart's later adaptation, thus posits participation as a matter of 'the more the better', where an increasing degree of target group involvement creates greater ownership and empowerment (Hart, 1992, Reid et al 2008). Others have modified this, noting that more is not necessarily better, but that participatory formats must be adapted to context, and that the opposite of top-down does not have to be a bottom-up approach, but that focus should be on the dialogue rather than who initiates and manages the process, as different degrees of control might be needed in different projects (Jensen, 2005).

Regardless of participatory degree, the values of health promotion require that participants be more than informants, respondents, users or patients, i.e. the objects of communication of expert knowledge: They are to be empowered as active agents in the facilitation of healthy changes. However, frequent critiques of the discourse of participation have pointed to the (mis)use of the notion within a neo-liberal context where empowerment is closely linked to ideals of self-management and individual responsibility for health, neglecting structural determinants of health, or pressuring people into unwanted self-responsibilisation (Horrocks and Johnson 2014,

Järvinen, 2012). Thus, critics argue, participation becomes mere neo-liberalism in disguise. Cooke and Kothari have questioned '*the participatory orthodoxy'*, by calling attention to the darker side of participatory processes, where ritualistic, manipulative or even tyrannical processes unfold under the guise of open-ended engagement (2001). Furthermore, as others have pointed out, processes of participation create their own relations of power, are infused with political discourses, and tend to produce certain legitimate positions and contributions (Kristensen & Bloch-Poulsen, 2014; Reid, 2008).

1.3.1.3 Interventions in everyday life

> Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love. Health is created by caring for oneself and others, by being able to take decisions and have control over one's life circumstances, and by ensuring that the society one lives in creates conditions that allow the attainment of health by all its members. Caring, holism and ecology are essential issues in developing strategies for health promotion
>
> WHO, 1986

As phrased in the Ottawa Charter above, health promotion works with interventions targeting everyday life and the settings in which it unfolds (WHO, 1986). The Charter stresses the societal, structural and policy dimensions of health promotion, thus emphasizing that health is not only the responsibility of the individuals. The aim is to not only equip individuals with knowledge, critical awareness and skills, but to create structures that support healthier living. Thus health promotion projects take place through interventions in schools, in clubs, in cities, and in home settings, as well as clinical settings. The WHO Shanghai declaration from 2016 particularly emphasizes cities and communities as crucial settings for health, stressing the challenges of inequity and structural barriers for good health in urban environments. The common denominator for the different kinds of interventions is that change is to be implemented in everyday lives to be sustainable.

1.3.1.4 Normativity in health promotion

Health promotion tends to distance itself from public health, which is articulated as medical, reductionist and behaviour-oriented, whereas health promotion, from its holistic and

participatory approach, provides a more ethically sound practice (Dawson and Grill, 2012). However, health promotion has also been criticized for being inherently ideological and entailing normative commitments. Some have argued that the positioning of health promotion as a contrast to biomedical discourse and individually-based approaches maybe tends to be more in the rhetoric than in practice (Green & Tones, 2010), and that health promotion does not differ markedly from previous authoritarian and paternalistic approaches, except from the use of new terms to conceal mechanisms of governmentality (Vallgårda, 2005). The notion of empowerment, it has been remarked, can be considered yet another kind of exercise of power via the instalment of technologies of self-regulation rather than direct prescriptions (Vallgårda, 2005). As mentioned initially, the broad and positive notion of health is the opening prayer of health promotion. Working in practice with a broad and positive notion of health is, however, not entirely straightforward. Defining the notion of health is in itself no simple task, with the numerous, co-existing and competing meanings and enactments, and sometimes inherent contradictions (Otto, 2008b). Biomedically defined and measurable health might be in contrast with individual, social and cultural perceptions of wellbeing and the good life (Otto, 1998; Otto, 2008b). The broad and positive notion of health within health promotion in practice tends to refer to a health definition that is compatible with biomedical definitions of healthy behaviour, and health promotion initiatives are typically oriented towards the classical lifestyle factors of diet, exercise, smoking, alcohol consumption and stress. The health promotion agenda is, however broadly conceived, still with the purpose of preventing disease and, especially in high-income countries, lifestyle-related or non-communicable diseases. There is as such a certain directedness of health promotion: Moving others to move themselves, to achieve a more or less narrowly defined target.

This also entails defining some measure of success, and consequently that health dimensions need to be translatable to measurable and comparable parameters. Preferably, health promotion efforts are efficient and reproducible and able to fulfil their promises of achieving better health conditions for the target group in question. In other words, not anything qualifies as ‘healthy’ behaviour, and wellbeing can only be promoted insofar as it is not in contrast with the existing definition of health within the specific project. By promoting health, practices are identified as ‘unhealthy’ or ‘not healthy enough’ (Mol, 2012). In sum, the notion of health within health promotion is infused with values and ideals, sometimes based on competing ideologies, and the practical performance of health promotion is entangled in political and financial agendas.

1.3.1.5 Summary: The paradoxes of health promotion

Health promotion is defined by being based on a set of values which distinguish health promotion from biomedical, health science and public health approaches. Contemporary definitions of health promotion emphasize participatory, democratic and holistic approaches to health in an everyday perspective, to distance health promotion from moralizing, behaviour-oriented or deficit-based approaches. Significantly, health promotion establishes close relations between health and democracy, by translating issues of health and quality of life into matters of empowerment, co-determination, equal rights and citizenship.

However, as the discussions within the discipline indicate, there are ongoing efforts to translate the very general and abstract formulations of goals and values into practice. As such, health is often defined as more than the absence of disease, but tends to be translated into risk and prevention. The discipline aims to acknowledge specificity and complexity, at the same time as struggling to produce objective and scientifically valid results. The prescriptions of openness and responsiveness to citizen input of the participatory paradigm struggles with which notions of health are acceptable in a project context, and predefined project frameworks. Thus health promotion seems to be caught between epistemes; struggling to release itself from a positivist paradigm and epistemological dominance of biomedicine and health science, while in practice applying the ontologies and epistemological values of the positivist paradigm.

1.3.2 The museum: From temple to forum?

I now turn to the museum literature and the growing topic of museums in health to engage in a discussion about the presumptions on which the idea of the health promoting museum is based.

1.3.2.1. Knowledge gaps and socio-scientific issues

> A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.
>
> ICOM: International Council of Museums (2007), available from http://icom.museum/the-vision/museum-definition/ accessed December 2017.

The ICOM definition of the museum from 2007, which is an international reference for the museum community, encompasses a number of different museum genres, which are gathered by the common characteristics listed above. This dissertation mainly concerns science museums and science centres (and a few children's museums), but they all share a common institutional heritage and societal function in their educational scope.

The first generation of museums largely build on a strongly authoritative learning conceptualisation, where the acquisition of knowledge was conceived as a one-way transmission to a relatively passive recipient public (Amodio, 2013). The science centres were introduced as a sub-genre of museums with the opening of the Exploratorium in San Francisco in 1969. The Exploratorium was founded with the aim to educate the public about natural science and the progress of scientific and technological development. The motivation for the new museum genre was a perceived knowledge gap between the scientific development and lay people's understanding thereof (Oppenheimer, 1968). The first science centres were based on a positivist learning paradigm, to provide hands-on exhibits that fostered inquiry-based discovery of 'the right' scientific answers (Bandelli, Konijn, & Willems, 2009; Simonsen, 2016). Later, science centres moved towards a more constructivist learning paradigm, with focus on the learner and the meaning-making process (Hein, 1998). There is now a marked focus on the visitor learning process as a dialogic interaction of institution and visitors, and the social contexts of learning (see e.g. Crowley et al, 2014, Falk & Dierking, 2000 Leinhardt et al, 2003). Some call this the third wave of museums (Crowley, Pierroux & Knutson 2014). Here, learning is conceptualized as an active process and an interaction between individual and surroundings. There is an emphasis on the active participation of the learner, and the responsibility for learning is located within the individual (Davidsson & Jakobsson, 2012, Leinhardt et al, 2002). The learning process often attempts to scaffold, by building on the existing knowledge and competences of the individual (Falk & Dierking, 2000, Simon, 2010, Simonsen 2016). Thus the museums have transformed from highly authoritative disseminators of pre-defined knowledge, to facilitators of dialogic learning and knowledge brokers, bringing audiences together to discuss and generate new meanings. This 'third generation' of museums increasingly focuses on addressing socio-scientific issues, and building critical competences rather than disseminating specific knowledge. The visitors are to be equipped to critically relate to socio-scientific topics, rather than just understand and recall knowledge (Simonsen, 2016). And museums are increasingly conceptualized as fora for critical discussion of socio-scientific issues and the formation of

critically-conscious citizens that actively participate in the generation of knowledge and opinions on social and societal challenges and dilemmas. The Association of Science-Technology Centers (ASTC) defines the aim of its institutions as '*advancing public understanding of science and contributing to the development of a scientifically literate society'*, placing '*particular value on meaningful exchange on societal issues, locally and globally, where understanding of, and engagement with, science is essential'*. (http://www.astc.org/about-astc/principles-and-practices/ accessed 2017). The aims of the ASTC thus define museums as knowledge brokers that participate in the negotiation of science and knowledge, rather than being authorities teaching a subject (van Dijck 2003 in Bandelli et al, 2009, Bandelli et al, 2009). This change has profound consequences for the positions and relations of museums and audiences, as the museum's role then becomes one of mediator and facilitator, and audiences to a larger degree become empowered to define, interpret and question science (Bandelli et al, 2009). In this move towards a public engagement with science approach, the museum becomes a setting for dialogue between equal parties, acknowledging and nurturing the competences and priorities of the public (Bandelli et al, 2009).

1.3.2.2 Epistemic regimes and social action

Science centres are by scientists and within the museum field considered politically neutral and non-judgmental and credible institutions that can facilitate a dialogue and bridge between the public and science (Bandelli et al., 2009). However, museums have always been political actors, embedded in current financial, political and epistemological structures and struggles, and the neutrality of museums is debatable. The museums have thus throughout history reflected the current political, scientific, and cultural paradigms, and served to support state, nation, art and science, establishing connections between cultural heritage, nations, citizen-subjects and political regimes (Abt, 2006, Fyfe, 2006, Preziosi, 2006; Stoklund, 1999). Through their collecting, displaying and classification practices, museums have contributed to the proliferation of epistemic regimes, and the production of communities, national identities, winners and losers in wars and disputes, but also challenged existing power structures by representing subaltern perspectives and giving voice to previously silenced groups (see e.g. Crooke, 2006; Macdonald, 2016; Otto, 2008a). The practices of exhibiting are thus highly political and social practices, rather than objective presentations, and thus require attention as such (Bandelli et al, 2009). Exhibitions and programs perform the issues and knowledge they communicate based on epistemological assumptions, political agendas and social values. When a phenomenon enters a

museum, becoming institutionalized, it becomes entangled with the power structures, socio-cultural and epistemological processes of the museum, and becomes part of a system of knowledge that enacts the phenomenon in a certain manner.

1.3.2.1 Museums in health

The present and future role of museums is continuously under debate as society changes; bringing new opportunities and challenges for the old institution (see for instance Black, 2012, Bradburne, 1998; Falk & Dierking, 1992; Hooper-Greenhill, 1999; Kelly, 2004; Quistgaard and Kahr-Højland, 2010, Toon, 2005). There is a consistent narrative about the impending dangers to museums in face of changing societal and organizational structures, new audience demands, new media, and new financial circumstances, which entail that museums must 'change or die' (Black, 2012, 1). There is a demand that museums must address current topics and contribute to solving societal issues. With health as a pressing societal and social concern, it is not surprising that museums are turning towards this issue. It has recently been argued that museums are particularly good actors for promoting health, because they have a unique position to promote health in a relevant, tangible and positive manner (see Christensen, Bønnelycke, Mygind and Bentsen, 2016). It is argued, that museums provide high credibility due to their curatorial practice and value-neutral environments, and that they can provide high impact, emotional experiences, that have the potential to change behaviours (Roland, 2010). This version of approaching health in museums is quite recent, and is still an area that lacks research (Chatterjee & Noble, 2013; Christensen, Bønnelycke, Mygind, & Bentsen, 2016). Museums are presently engaging in discussions regarding how they can contribute to health and wellbeing, what kinds of outcomes can be produced, and not insignificantly, how they can be measured (for instance at the British Museums Association conference in Glasgow, November 2016, and the British Visitor Studies Group annual conference in London, march 2017, where significant attention was granted to museums' contribution to and impact on health and wellbeing).

At present, many museum health initiatives, especially in the UK, focus on the cognitive and wellbeing effects of museum-based activities, such as the handling of objects, engaging in creative tasks and social interaction within a museum setting (Chatterjee & Noble, 2013). Thus the focus is mainly on the health and wellbeing effects of experiences and activities that the museums already offer, or programmes based on existing objects or exhibits. Some museums, however, have designed exhibitions and programmes that aim to promote health. As part of the research for this thesis, I conducted a scoping study together with fellow researchers from Steno,

where we analysed health promoting exhibitions in children's museums, science museums and science centres in the US to assess their scope and aim (see **appendix 1**). They most commonly focused on the 'classical' health dimensions of physical activity and nutrition, but also spanning across topics such as hygiene and disease prevention, sleep, stress and dental health (Christensen et al., 2016). We could conclude, that mostly the literature contends that museums should contribute to health promotion, and that they can, and then proceeds to the practical dimensions of how it can be done. Little effort is concerned with the assumptions and implications of this development, and there is a significant lack of critical discussion of the political, epistemological and ontological ramifications of museums venturing into health promotion. This despite the significant attention granted in the museum literature to the social and political role of museums historically and today. This motivates the focus of this dissertation, where I, with a point of departure in the case of PULSE study the norms and values activated by the transferral of health promotion into a museum setting, and discuss the implications for both health promotion and, in particular, the museum institution.

1.3.2.4 Inclusion and equity: Knowing the rules of the game

Another motivation for situating health promotion in a museum context is the argument that museums provide a more welcoming and less stigmatising setting than clinical ones (Camic & Chatterjee, 2013; Dawson, 2012, 2014). Museums thus might serve to attract and include those that do not normally respond to health promotion efforts, and by providing a fun, hands-on and social learning experience they might increase the chance of reaching target groups (Chatterjee & Noble, 2013; Christensen et al., 2016). Inclusion is a consistent focus area within museums, which continuously seek to engage new target groups, reach underserved users, and provide programming and content directed at minority groups (see for instance the International Council of Museums' Cultural Diversity Charter; ICOM 2010). Museums have formulated aspirations to become agents of social inclusion and social meeting places, actively contributing to the formation, identity-making and positioning of communities (Sandell, 1998; Black, 2012). Thus museums today can ideally serve as:

> A memory store for all in the local community, relevant to and representative of the whole of society; accessible to all – intellectually, physically, socially, culturally, economically; a celebrant of cultural diversity and promoter of social inclusion, with a core purpose of improving people's lives; a place of dialogue and

> toleration, and a community meeting place, committed to promoting civil engagement.
>
> Black, 2012; 5

Despite the increasing attention to exclusion and inequity, the majority of science museum visitors tend to be socially privileged, white middleclass or upper-middleclass (Dawson, 2014), and a similar social imbalance is at stake at museums in general: Cultural, social and political exclusion tends to be repeated at the museum (Sandell, 1998). Recent research has remarked that existing power structures and discourses continuously reproduce participation inequalities and place the responsibility for change on the disadvantaged audience, rather than changing the structures of the museum (Archer et al., 2016). Gender, ethnicity and socio-economic status are still significant markers of difference in museum attendance. Studies have highlighted a gender bias in favour of male experiences in exhibit design, and the reproduction patriarchal imagery and gender stereotypes (Dancu, 2010, Machin, 2008). Especially science and science learning environments such as museums, tend to reproduce a normative, white, upper-class, masculine culture (Archer et al, 2016). Science is generally associated with specific values like objectivity and particular linguistic practices, and the display of science often requires specific cultural, social and linguistic skills, that minority groups might not possess (Archer et al, 2016, Dawson, 2012). Danish Ethnologist and researcher in digital museum design, Celia Simonsen, remarks that, at the science centre:

> Visitors are expected, regardless of background, to investigate and experiment with science phenomena and gain the skills to understand the world better. Interest, motivation and curiosity are the driving forces, and physical engagement and reflectory participation are requirements (Simonsen, 2016, 24. My translation)

Simonsen describes, that despite the ambition to create playful and dialogic learning, there are still a certain range of ‘correct answers’ and learning messages based on pre-defined facts about scientific phenomena, and the visitors are supposed to engage in a certain way (Simonsen, 2016). There are thus a certain skillset and basic requirements for knowing the ‘rules of the game’ necessary to be included at museums. Despite the aims of creating open-ended, context-sensitive and audience-oriented learning processes, the learning opportunities at modern museums are still limited by the norms and ontology inherent in science, the exhibition design, and the organization of learning.

1.3.2.5 The participatory museum: new power balances or business as usual?

As part of the focus on cultural inclusion and diversity, the ICOM emphasizes 'participatory democracy' in its diversity charter:

> To promote enabling and empowering frameworks for active inputs from all stakeholders, community groups, cultural institutions and official agencies through appropriate processes of consultation, negotiation and participation, ensuring the ownership of the processes as the defining element.
>
> ICOM, 2010, 1

The charter links inclusion with participation, thus considering participation as means of facilitating inclusion and ensuring ownership and relevance for different audience groups. However, how participation is to be achieved is not specified in the charter. A substantial amount of museum literature deals with participatory processes, defining the notion of participation in various ways, spanning from interactive learning processes experiences, to processes of sharing power and influence with the visitors, through the generation of contents and contributing to discussions, performing citizen science, co-curating and shared decision-making (Bandelli et al., 2009; Knudsen, 2016; Simon, 2010). Within museology, this orientation towards public participation is often characterized as a move from a 'deficit' communication model, where the public lacks knowledge and is in the need of education, to one where participants are acknowledged as equally competent and resourceful co-creators of knowledge. The participatory turn within museums reflects a larger, societal turn towards collaborative (knowledge) production and co-creation, infused with democratic values and discourses of legitimacy, sustainability and socially robust knowledge (Gibbons, Nowotny, & Scott, 1995; Nowotny, 2013; Phillips, 2011).

However, the museums' orientation towards participation has been criticized for being token, and the expression of a trend that does not resonate with actual museum practice, which, despite the use of participation as buzz-word, continues much as usual (Lynch, 2011, Petersen, 2015 in Knudsen). It has been argued that only limited degrees of influence or change result from participatory processes, and that participation tends to take place within the boundaries and experiences designed by the museum (Bandelli et al, 2009). Thus, participation is limited to fit into the existing professional practice. For instance, front-end studies where audience opinions on coming exhibitions are sought tend to take place when the project has already taken shape

within the museum. The front-end thus merely remains a tool for testing exhibition ideas, and public involvement has no direct impact on the epistemological basis in the science centre (ibid). Studies have pointed to the conflicts and limitations in audience influence in museum-based participatory processes. In a participatory action research project with youths, Tzibazi (2013) described how the participants in the involvement process learned to adjust and orient themselves towards the museum professionals' existing valorisations of input, rather than the participatory process being one of mutual adjustment. Tzibazi problematizes the apparent lack of will to make participation about processes of reciprocal change. Others have noted, that participatory process more often are shaped by the agendas of the institution, with pre-determined output and certain favoured outcomes, than being the democratic process they claim to be (Fouseki, 2010; Lynch and Alberti, 2010;; Lynch 2011; Morse et al, 2013). Furthermore, the institutional framework of the museum, with its planning processes and operating procedures, are in conflict with the uncertainty and unpredictability of the participatory processes (Morse et al, 2013). The ambitions to give audiences the opportunity to shape content and learning process require institutional reorganizations, as participatory processes challenge existing power structures and traditional working methods (Sanders & Stappers, 2008). Thus professional practice and institutional structures have to adjust to the participatory agenda (Bandelli et al., 2009).

1.3.3 Summary: Health promotion meets museum: Bridging the gap or preaching to the choir?

With my reading of the literature that address issues of participation, values and disciplinary history from both fields I can point to a related set of visions in both disciplines, grounded in a larger, democratic and participatory paradigm – and also a related set of challenges and ambivalences in realizing these visions. There are some paradoxes in the democratic, participatory and positive and open learning aims, and their practical implementation. Health promotion is characterized by a paradox in the juxtaposition between the aim to be democratic, participatory and bottom-up, and the interventionist agenda with pre-defined outcomes and disciplinary criteria for measuring impact. The interest within health promotion to expand to new settings in order to provide more relevant and inclusive learning makes the museums attractive partners, and the appeal is mutual, as the museums are seeking to consolidate their position as relevant and socially responsible actors. The museums literature articulates the museums as

knowledge brokers and fora for public discussion; that is, as value-neutral spaces where dialogue and participation can unfold freely. The institutional and social history of museums shows the deep entanglement of museums with social and political structures. Their exhibitions enact specific versions of reality, based on institutional, political and financial interests and dominating values and world-views. With the move towards dialogic, open-ended learning processes, the development of democratic skills and providing activist, social spaces, museums aim to become public fora for meaning-making and discussion, and to move away from the authoritative role. This, however, might be another kind of enactment of authority. The participatory and democratic agendas also carry assumptions, enact values and certain subject positions, as critiques of participation, dialogue and empowerment within both health promotion and the museum field have shown. The democratic paradigm also proscribes certain, legitimate modes of participating, and establishes certain kinds of relations between institution/initiator and participants. Thus participation is highly fraught, and entails issues of power, inequity and epistemological norms. Inequity and social exclusion are still issues at museums today. Despite efforts to be inclusive, the reproduction of norms and majority values prevails, alongside a lingering normative and authoritarian approach to learning. Furthermore, with their histories of power, politics and economy (Dankl, Mimica, Nieradzik, Schneider, & Timm, 2013), the museum setting tends to support certain configurations of visitors and (re)produce particular subject positions and learner identities.

Both museums and health promotion turn to participation to solve the issues of inequity and legitimacy, in the hope that increased target group involvement can provide more socially robust and relevant knowledge. I would argue, that instead of taking the positive outcomes of the meeting between health promotion and museum education for granted, and assuming that participation per se will lead to change and improvement, there is a need for discussions on in which processes and shapes science centres can share power with the public, alongside with openness about the threats and challenges of this process[12](Strathern, 2009). Participation, the

[12] Here, I take inspiration from a lecture and accompanying manuscript by Marilyn Strathern at Copenhagen Business School in 2009, where she discussed the implications of working with the notion of 'synergy'; that interdisciplinary meetings inevitably automatically will produce 'more'; that more value and better results will be the outcome. She also recounted a research project 'led astray by its own rhetoric, its own imagination, in other words by its own proposal' (Strathern, 2009, 3): That in a world of grant applications and research proposals, results tend to be anticipated in promissory notes, which weave magic of buzzwords and high hopes. Rather than be swept

literature shows, also has its norms, prescriptions and requirements. When engaging in participatory knowledge production, the traditional process of generating and stabilizing expertise and authority is disrupted, it is argued (Golding, 2013). But then, only to a limited extend is authority really redistributed, as the critics have pointed out. These challenges have inspired the formulation of my research questions. I suggest that by venturing into the field of health promotion and formulating explicit interventionist agendas museums leave the recently claimed value-neutral territory that provides a platform for critical discussion. What is needed, I argue, is debate on this development: A critical, research-based engagement with questions like which kinds of contributions museums can and should make within the field of health; how this development affects the social and societal role of museums, and on the methodologies, outcomes and implications of health promoting museums.

away by the visions painted, some critical scrutiny of the actual execution of the work in practice is called for. I might be taking liberties with Strathern's points, but this is my interpretation of her arguments.

1.4 Science, health and the social

1.4.1. A science studies and performativity approach

In this chapter I account for the theoretical framework that informs my analyses as well as my overall approach to museum-based health promotion. My point of departure in STS (Science- and Technology Studies) and post-ANT (Actor-Network Theory) provides not only the analytical tools for empirical material, but lends me some overall perspectives on the conditions and implications for knowledge production, and the relations between methods and realities, and between science and the social. As my research spans across fields, disciplines and sites, and I endeavour to perform my double cultural analysis – both in and of the project – it seems suitable to do so from an approach that encompasses complexity and ambiguity, acknowledges partiality and situatedness as conditions for knowledge production, and which does not give credit to a priori assumptions about what is at stake, or grants primacy to a particular discipline or kind of knowledge. STS and post-ANT accounts often start in the middle of things, trace relations and connections, and can grant equal attention to tiny objects, large organizations and individual experience.

The four articles in my dissertation cover very different topics and areas: They are located in- and outside of Experimentarium, at other museums, in Hellerup and in Husum, and they concern different stages, actors and methods of the PULSE process, from vague ideas, to final products, from designers and researchers to super-users and non-users. In fact, a large part of the study concerns people that do not take part, and are thus significantly absent. A science studies approach enables me to enrol and connect the very different actors and situations, and yet create resonance between them, to compose an assemblage of approaches that encompass the different stages and issues of the PULSE project. STS has sub-branches within health, design, public engagement and countless other fields, and lends itself equitably to application in a health promotion or a museum setting. An STS-based approach thus enables me to address paradoxes and complexities within both health promotion and the museum world and to shift between political, institutional and micro-socio-material interactions.

I therefore employ different analytical concepts in the articles to approach the different problem complexes the articles engage with. The analytical concepts all stem from the same prolific and variegated field and ultimately, in their different manifestations, tell a story about managing complexity, of making sense out of mismatches and paradoxes. This approach enables me to

engage with PULSE as a complex, heterogeneous and metamorphic assemblage of people, processes, places and things, that is more than its parts, and produces many different effects, and to grasp with different tools at its extremities.

Firstly, I will account for Science- and Technology Studies as the overall theoretical orientation which provides me with certain analytical and empirical interests, and which has shaped my engagement with my empirical and analytical field in particular ways. Next, I will go further into the analytical concepts derived from the STS that I employ in my analyses and discussions.

1.4.1 Science and Technology Studies

STS is a diverse and wide-reaching field, covering, to name but a few areas, studies of technology, innovation, organizations, the body, health and the production and proliferation of different knowledge regimes (Jasanoff, 2004; Jasanoff, Markle, Peterson, & Pinch, 1995; Knorr-Cetina, 1995). Common features are the understanding of natural and social phenomena as socio-materially enacted, and an agnostic approach, which dismisses preconceptions about the matter at hand, insisting that the 'nature' of the object of study is an empirical question (Berg & Akrich, 2004). A proliferating notion is that of co-production, which posits that science and the social are not separate entities, but mutually constitutive. Thus science and its implements are products of social processes, and constitutive of social life (Jasanoff, 2004). The relationship between science and the social is performative; they are deeply entangled, and therefore one cannot be understood without the other. STS originates from the laboratory studies of the 1980s, where ethnographers and social scientists entered science labs and studied the production of scientific facts (Knorr-Cetina, 1995; Latour & Woolgar, 1986). The laboratory studies recounted the orchestrated activities of numerous heterogeneous actors resulting in the production of stabilized facts and spokespersons, and pointed to the various practical, political and normative factors shaping the results, thus emphasizing the crafted and social nature of science (Callon & Law, 1997). An important point in studying the enactment of expertise and knowledge has been to accentuate the performative power of knowledge forms: That they proliferate due to their stabilization and successful alignments of actors and interests, and that they are the result of historical, socio-material processes, and they have ontological effects: They produce realities (Law, Rupert, & Savage, 2011). The aim of these analyses are not the debunking of scientific knowledge, on the contrary, they demonstrate the remarkable durability and power of scientific

practice. A phenomenon is no less real because it is produced; rather it has weight and solidity due to the activities invested in producing and maintaining them.

However, by demonstrating the historical, social and epistemological contingencies, and shedding light on the tensions between messy realities and the purification of knowledge, scholars have pointed to the need to recognize the invisible or silenced actors and processes that tend to be undervalued within certain scientific paradigms, and to shed light on epistemological hierarchies and power struggles (Stengers, 1997; Thorgaard, 2009).

I employ this foundational agnosticism of science studies to craft an approach that does not take predefined values, outcomes or explanatory models for granted, but rather explore the enactment of ontology through the health-promotion process. There is, however, despite the agnosticism, a basic credo within STS; the foundational approach to scientific knowledge: That it is not objective, stable and universal, but situated and produced. I employ this stance to approach health promotion as well as museum practice as contingent, shaped by their institutional, political and epistemological history and relations.

1.4.3 Networks, assemblages, collectives

Studies within STS have emphasized the active role of materiality – objects, technologies, artefacts – in shaping social interactions, organizations, forms of knowledge and expertise (Berg & Akrich, 2004). A central point, formulated in Actor-Network-Theory, or ANT[13], is the heterogeneous and distributed character of the social: That all entities are networks of heterogeneous elements, that the relations between social and material composites create the possibility for action (Callon & Law, 1997; Latour, 2005). ANT studies the webs of relations and practices that produce and gather different kinds of actors, and consider these actors as effects of the enactments (Law, 2007). The heterogeneous networks enable individuals to appear as singular entities, but they are enabled to do so because of the networks they are part of. People are networks, and devices are networks; collectives (Callon & Law, 1997). British STS-scholar

[13] Some prefer the term material semiotics, to indicate that the approach is neither a theory or a coherent explanatory framework, but rather a set of approaches applied in very different fields and drawing on several theoretical resources (Law, 2007)

John Law makes the point that aircrafts do not fly; airlines do: Without the organizational structure of the airlines, providing personnel, procedures and the infrastructure to enable flight, aircrafts would be nothing but immobile piles of metal (Law, 2002). Material semiotics presumes that action is located in such heterogeneous assemblages, or hybrid collectives, whose form and properties are not stable, but change through interaction: They are '*processes of transformation, compromise and negotiation'* (Callon and Law, 1997, 3).

This provides me with an entry to grapple with PULSE as a socio-material assemblage and entity, and to trace its connections and relations, actors and kinds of action that are enacted in PULSE. It also allows me to sometimes refer to PULSE as an actor in its own, to let the project 'do' and 'perform', which in an ANT conceptualization, it can, as the heterogeneous and performed entity it is.

I employ the notion of socio-material collectives to engage in an understanding of everyday life that encompasses the social, the material and the processual, to conceptualize the target groups of health promotion in a manner that encompasses the heterogeneity and the symmetry and orchestratedness of action that is emphasized within Law's version of STS. I unfold this more in **article 1** and **section 2.3.**

1.4.4 Multiplicity, ordering and enactments of bodies, disease and health

The performative turn within STS emphasizes ambiguity, multiplicity, situatedness and partiality, rather than the stabilization and durability of the networks[14]. A performative approach takes the world to be continuously performed and emergent. Scientific and professional practice strive to produce order, and these processes of ordering and producing knowledge are situated, partial and plural (Mol, 2002; Haraway, 1988). Studies have dealt with how contrasting and co-existing versions of reality are produced and coordinated in scientific and professional practice, making ontology multiple instead of singular (Mol, 2012). Based on the empirical analysis of an organization, Law developed the notion of modes of ordering: Recurrent logics or patterns of action and meaning, performed by heterogeneous actors (Law, 1994, 2001). These modes of ordering consist of performances and statements about how things are, how they should be, and

[14] The performative turn is therefore also ssometimes labelled post-ANT

they assign roles and identities to actors. They make a repertoire for action and meaning-making through their logics. Law himself refers to them as a kind of Foucauldian mini-discourse, and recounts their connection with issues of power, dominance and subjectivity. Different modes of ordering co-exist, producing different subject positions, forms of knowledge, material arrangements and forms of organization. Law calls for a 'modest sociology' to account for these processes, and be conscious of our own contributions to the imposing of order in our efforts to make things knowable (Law, 1994; Law, 2004). I employ Law's notion of modes of ordering to study how PULSE creates order and make things knowable, and thereby the logics PULSE impose, with reality-making effects. In **article 2**, I furthermore elaborate on the notion of modes of ordering by connecting it to the participatory agenda of PULSE, and how specific modes of participation are afforded by the project.

Together with Dutch anthropologist and philosopher Annemarie Mol, Law has furthermore described the simultaneous performance of co-existing versions of bodies and diseases, and emphasized the ongoing nature of these performances (Mol and Law, 2004). They conceive of phenomena as enacted in specific, situated practices, and existing through their continual performance (Berg and Akrich, 2004; Mol and Law, 2004). Bodies and disease – and consequently health – are not pre-existing, but come into being from the processes of studying, documenting, and making them knowable (Berg and Akrich, 2004; Berg and Mol, 1998; Mol, 2002). As Mol describes, different, co-existing enactments produce multiple versions of a phenomenon, such as atherosclerosis (Mol, 2002). Thus medical practices produce different ontologies; multiple, co-existing ontologies. Reality is not objective, but multiple, and enacted through knowledge practices. Mol suggests to engage in political discussions about the normative implications of the realities that are enacted by knowledge practices, and to discuss which versions are preferable; a commitment to ontological politics (Mol, 1999). Embracing the situatedness and partiality of performativity thus enables a political engagement with world making that is normative, activist and interventionist. Through medical practice patients, communities, and health conditions are managed and enacted. Through socio-material medical procedures, bodies and subjects are choreographed, objectified or subjectified, rendered passive or enabled – even required – to act, take responsibility, to assume a certain identity (Cussins, 1996; Moreira, 2004; Nielsen, 2003). Mol describes how responsibility for health and the treatment of disease tends to be discursively framed within a logic of choice: An approach to patients and citizens that is based on behavioural and individualistic principles and processes of

abstraction which neglect to cater for the specificities of health enacted (Mol, 2008). Too often, efforts to improve public health are based on the attempts to persuade individuals to 'choose a healthy lifestyle'. Such a general approach do not distinguish between specific people in specific situations, but assumes that because populations are in general unhealthy, then the individuals must also be, and by encouraging all individuals to exercise more, the problem is solved. Furthermore, such general approaches fail to address the practical arrangements and negotiations of everyday life. In contrast, Mol describes an opposing logic; *the logic of care,* suggesting that good care depends on specification, on tinkering with practicalities, on '*handling daily life, of making things work from one day to the next*' (Mol, Moser and Pols, 2010, 17). This highly situated and practice-based understanding of health as continuously performed by heterogeneous assemblages provides an approach to health promotion that fosters practical engagement with the heterogeneous, complex and ongoing enactments of health, not as abstract knowledge about populations or in the shape of general recommendations, but as practical tinkering with the everyday practices of health in assemblages of bodies, homes, objects, family relations and ways of knowing and experiencing health. As Mol puts it: *"The logic of care does not start with individuals, but with collectives*" (Mol 2002:68). I employ Mol's notions of care and collectives to resituate health promotion and approach the target groups of the PULSE efforts as collectives in a care-based and tinkering manner. I expound on this in **article 1** and **section 2.3**.
To engage with these everyday practicalities, handling everyday life and come close to understanding its dynamics and complexities, I build upon the ethnological tradition of studying the everyday, the mundane and the interplay of the social and the material in the daily production and reproduction of culture, family, relationships and social structures.

1.4.5 Practices of everyday life: households, routines and *the good life*

To engage in discussions about how health promotion as conducted in PULSE can engage with everyday life, I draw on conceptualisations of the everyday stemming from research traditions within ethnology, and from practice theory.

Everyday life, from its public manifestations to its intimate private spheres, is the site for competing efforts to intervene, improve, and encourage populations to live better, more healthily, more sustainable and more profitable (Sandberg, 2014). Changes in health, lifestyle and disease take place in the everyday, and health promotion seeks to intervene in everyday lives. Knowledge about the components and dynamics and different actors and interests of the

everyday is therefore crucial for the efforts to facilitate change. Everyday life in its different guises is one of the main interests for Ethnologists, but remains, despite its ubiquity, saliently elusive (Sandberg, 2014). An ethnological definition of everyday life could be the habits and routines, the mundane, repeated tasks, that in their repetitiveness generate both stability and subtle, gradual change (Ehn & Löfgren, 2010). Ethnologists have for decades studied these routines and everyday occurrences that constitute everyday life, including the material, symbolic and discursive expressions of culture and the social. This includes, to name but a few topics, folk culture, national and cultural identity, social organization, production and consumption, and relations between state and lifeforms. A recurring theme is the collective character of everyday life: That it is not solely performed by individuals, but situated in families, communities and other forms of social organization , and based on the practical enactment of work, the performance of rites and traditions, common values or beliefs. In other words, a conceptualization of everyday life as practice. These practices of the everyday are situated, specific, collective and routinized (Lassen, 2014). The home and the household are central concepts within the ethnological tradition, as sites for the performance of the daily routines and tasks, as basic units for the organization of labour, local community and governmental administration. The longstanding focus on community, village and work-and production based lifeforms has made the household a pivotal context for the enactment and transformation of everyday practices and ideologies (Christiansen, 1996; Damsholt & Jespersen, 2014; Højrup, 1966; Højrup, 1989; Löfgren, 1972; Stoklund, 1985).

A continuous debate regards the constituents of the everyday, and the relations between studying, intervening, preserving and changing traditions (Sandberg, 2014). Central to ethnological approaches to everyday life is the notion of the longue durée; enduring structures and "*old attitudes of thought and action, resistant frameworks which die hard, at times defying all logic*" (Damsholt & Jespersen, 2014). Within these stabilized patterns, change often happens gradually and imperceptibly, through small variations and adjustments to everyday routines (Ehn & Löfgren, 2010). A central concept within Ethnology is that of *the good life*: The values and aspirations that shape and drive the organization of everyday life. Understanding the performances of the good life is pivotal for any efforts to facilitate change, as any change must be compatible and acceptable within the existing logic of the good life (Damsholt & Jespersen, 2014).

In recent years, studies of health and innovation have become significant research areas within Ethnology (Damsholt, 2011; Jespersen, Petersen, Ren, & Sandberg, 2011; Lassen, 2014; Lassen, Bønnelycke, & Otto, 2015; Otto, 1998; Winther, 2017). Damsholt and Jespersen (2014) have pointed to the specific configuration of everyday life as an object of study by interventionist agendas, describing how research on the everyday has been closely related to political agendas, such as the biopolitical gaze of the pastoral power of the state in the late 18th century, or the cultivation of a national identity in the National-Romantic Era. Thus everyday life, as an object of study and a concept, has emerged from the endeavours of studying, preserving and transforming it. Everyday life is thus not a pre-existing entity, but grows from situated fields of knowledge and the historical, disciplinary and political interests in 'it'. These studies have particularly focused on the relations between interventions/innovations and the processes and structures of the everyday, and how everyday life is articulated and problematized through interventionist agendas. They have pointed to the cultural specificity, situatedness and complexities of everyday life as practice, and called attention to the struggles and negotiations of intervening in the practical arrangements and performances of the good life, active ageing, or workable everyday routines (Jespersen et al., 2011; Lassen, 2014; Winther, 2017). This means that interventions must then engage in tinkering efforts with these repeated performances, alongside addressing and accommodating notions of the good life.

My foothold in Ethnology provides me with an overall conceptualization of the everyday as practiced, situated and complex (Damsholt, 2011; Ehn and Löfgren, 2010; Jespersen, Petersen, Ren, & Sandberg, 2011, Löfgren, 2014). To mobilize a more concrete analytical apparatus to approach the everyday lives and health of the PULSE target groups, I draw on practice theoretical approaches, that are similar to the ethnological in their conceptualization of the everyday as routines and habits, socio-material enactments and change within continuity. Additionally, one can in practice theory discern the affinity to STS, and practice-based approaches are often employed within subgenres of STS, in for instance studies of innovation and everyday use of technology (Shove et al, 2012; Gram-Hanssen 2010, 2011; McMeekin and Southerton, 2012; Røpke, 2009; Røpke and Christensen, 2012). Practice-based approaches come in numerous variations, but with the common denominator of the focus on doings, routines and performances, and the orientation towards the socio-material heterogeneity and distributedness of practices. A practice emphasizes the tacit, mundane and practical character of daily processes, combining the social, practical and material. 'Lifestyles' or 'behaviours' are not only based on

individual choice and preference, but on what is possible and makes sense within a given practice. German sociologist and researcher within practice theory Andreas Reckwitz provides one of the classic definitions of practice as consisting of:

> …several elements, interconnected to one other: forms of bodily activities, forms of mental activities, things and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice – a way of cooking, of consuming, of working, of investigating, of taking care of oneself or of other etc. – forms so to speak a 'block' whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements.
>
> Reckwitz, 2002, 249-50.

I understand practices as dynamic, heterogeneous assemblages of people, objects and places. They are condensations of repeated performances that create stability, yet through their repetition also continuously change (Shove, Pantzar, & Watson, 2012).

By focusing on practices rather than individual behaviours, health becomes part of distributed, socio-material and entangled practices that are complex and dependant on the stability of assemblages of different elements (Shove et al., 2012). They require crafting and effort to be upheld, but also gain stability through repetition. The continuity and repetition of practices become the means to facilitate change, rather than obstacles. This approach to change is what inspires my application of practice theory in a health promotion context, as it stresses the necessity to not just provide more knowledge, but also address value-based, material and structural barriers or facilitators for change. A health promotion effort must thus be designed to address the different components of health practices rather than informing and motivating individuals (Cohn, 2014).

In **article 1 and chapter 2.3**, I build upon the notion of practices to refocus the efforts of health promotion, and to suggest a broader perspective for understanding the target groups. The practice-based perspective thus places the practices rather than individuals and behaviours as the targets for health promotion.

1.4.5 Co-enacting problems, target groups and solutions

To approach the design process in PULSE, I have turned to the substantial field within STS that concerns itself with the study of design, innovation and user involvement. What these very

different studies have in common, is that they challenge the widespread notion of innovation as a process of 'uncovering' pre-existing, latent user needs or problems. Instead, a number of STS scholars have demonstrated how the needs are often created in and by the innovation processes, and the users are constituted as users through meticulous processes of engaging and scripting them to make use of the innovations/products in certain ways (Oudshoorn & Pinch, 2005; Suchman, Trigg, & Blomberg, 2002). The specific constellation of actors in innovation processes define how users are articulated, problems defined and solutions designed in a process of negotiating and aligning interests, competences and possibilities for action (Lassen et al., 2015). Thus the problems that are articulated and sought addressed by the innovation process, emerge within this process. Notably, they are doable problems; problems the project constellation is able to address, and which fit into the gathered, negotiated and aligned agendas of the participants (Fujimura, 1987; Lassen et al., 2015). And a given solution or technology, as put by Jeanette Pols "*does not solve problems that are already there, but helps to enact particular problems as the ones needing to be attended to*" (Pols, 2005)[186]. Thus these processes that produce innovations or designs, problematize the target groups by providing them with 'solutions'; they enact a specific set of problems, solutions and users – or, as put in performative turns; they enact realities, too. The design products are inscribed with norms and values; assumptions about the users, who they are and what they need, alongside prescriptions of use (Oudshoorn & Pinch, 2005). On the other hand, the prescriptions within innovations are not deterministic; the users are able to resist scripts, change the use of designs, and make creative adaptations. As with the study of the socio-technical processes of producing and mobilizing scientific knowledge, the STS approach grants attention to how agency becomes distributed and enacted in different forms through the innovations, and how new practices and forms of knowledge are enabled by the technologies that emerge. For instance, how bodies and diseases become knowable and enacted through technologies to monitor, diagnose and regulate them (Mol, 2002; Nielsen, 2003). How new exercise practices are enabled by the production of a technology that fits into, but simultaneously alter, the socio-material practices of walking (Shove & Pantzar, 2005). Or how aging becomes enacted through technologies to assist active aging (Ertner, 2015; Lassen, 2014). With this STS approach to innovation, I can thus study the development process of PULSE as one of producing and transforming socio-material relations, by following the imaginative and practical activities of this process (Suchman et al., 2002). The design process and products produce relations, subjectivities and values. They are negotiated, articulated and taking form

through the design process. I use this approach to ask which kinds of power, knowledge, authority and action are produced and distributed in PULSE, and how the project enacts specific problems, target groups and solutions through its design process. This is unfolded in **article 3** and **section 2.5.**

1.4.6 Logics and ontological norms

In **article 4** and **section 2.6** I turn once again to Annemarie Mol. In her study of the tensions between pleasure and bodily control in different dieting techniques, Mol describes how different dieting advice presented to patients in a nutritionist's office enact different realities, and different goods and bads (Mol, 2012). The dieting techniques are based on epidemiological knowledge translated into health advice. On the surface, this advice 'just' tells people what to do , but underneath are hidden layers of assumptions – about nature, culture, bodies and pleasure, about what we like to do, and what we should do. The health advice thus carries both norms and ontologies – ontonorms. The dieting techniques are based on various traditions within science, and work with different versions of bodies with different suggestions as to how it should be managed, nurtured or disciplined, along with different foods, ideals and dangers to health. In introducing a solution (diet) to a problem (overweight) they incorporate certain norms and make assumptions about the body. They afford different possibilities for act, and enact processes of valuing bodies and food. Despite their variations, the dieting advice Mol engages with, tend to enact a body that is problematic under the present cultural circumstances: That is, a body, whose predispositions for storing fat and craving calorie-dense foods becomes problematic in a society dominated by easily accessible food and sedentary lifestyles. Consequently, a mind-body divide is produced, where the mind has to exercise control over the body. What appears to be simply different dieting techniques, carry normative assumptions about the nature of the body, its relation to culture, the mind, and raises questions of control and enjoyment. This prompts Mol to ask which kinds of bodies are enacted through this advice, and to explore the different versions of what it might be to improve. Mol suggests that '*professional practices where science is being mobilized in order to improve daily life may be analysed by hunting for the ontonorms that inform them'* (Mol, 2012:13). In **article 4** I follow Mol's suggestion to analyse health promoting exhibitions for the ontonorms they carry. I view Mol's logic of choice as one such ontonorm; enacting a reality with health subjects that make informed choices about their own health, based on the knowledge and motivation provided them by health education.

1.4.7 Public Engagement with Science

As described in **section 1.3**, the emergence of science centres in the beginning of the 1970'ies was based on an increasing political and scientific concern regarding public lack of knowledge and understanding of scientific progress, resulting in growing levels of public detachment and mistrust. As a result, the mission to inform and educate the public was launched, including efforts to educate through science centres, and the establishment of the field of Public Understanding of Science (PUS) (Wilsdon & Willis, 2004). This approach to science communication was largely based on the 'deficit model'(Irwin & Wynne, 2003); the assumption that the public mistrust in science was due to a lack of knowledge, and increasing the *scientific literacy* of the public by providing sufficient information would mitigate this. This approach articulated the public as ignorant, and allocated scientists and scientific knowledge a privileged position (Horst, 2008). It was also based on a clear-cut distribution of roles, where scientists produced science, which was objective and universal, which was then communicated to a public which had little influence on the production and application of science (Wilsdon & Willis, 2004). The deficit approach has been criticized for failing to acknowledge the social, cultural and everyday experiences and perceptions of science and to not value the resources and opinions of lay people (Irwin and Wynne, 2003). Thus dialogue and public engagement with science (PES) came into focus as part of the wider movement towards democratization of science and collaborative knowledge production, where the active involvement and dialogue with citizens provides a democratic foundation and legitimacy for science (Gibbons, Nowotny, & Scott, 1995; Horst, 2008; Phillips, 2011). Ideally, the public engagement is intended to create socially robust and democratic knowledge, and to hold science answerable to fundamental questions about ethics, power, representation and responsibility (Wilsdon & Willis, 2004). The public involvement can take different shapes, from focus groups to consensus conferences, social media-based dialogue, citizens' juries, citizen science, and more. (See e.g. Davies et al, 2009, Horst, 2008, Wilsdon and Willis, 2004,).

However, the notion of public engagement has produced axiomatic notions of participation, citizenship and public opinion, where the figure of concerned citizens assemble in response to a pressing socio-scientific issue, to enact their democratic right and influence policy and science. Chilvers and Kearnes note, that the PES movement has resulted in a proliferation of methods for fostering public engagement, with the side-effect of constructing ideal-typical " '*opinionated publics', who possess unique preferences and attitudes concerning developments in science and*

technology". (Chilvers & Kearnes, 2016, 8). This positivist notion of 'the public' as pre-existing and in possession of innate beliefs and opinions on socio-scientific and political matters has gained foothold through an institutionalization and commercialization of public engagement, which is being employed by neo-liberal science policy (ibid). In this version of public engagement, participatory democracy is framed within a normative framework that conceptualizes participation as discursive and deliberative, seated in formalized and standardized formats for participation (Marres & Lezaun 2011 in Chilvers & Kearnes, 2016 p 11). It furthermore assumes that citizens are already interested in and willing to participate in socio-scientific issues, which is far from always the case (Delgado, Lein Kjølberg, & Wickson, 2011). A body of critical work has highlighted the adverse effects of prevalent participatory formats to exclude, disempower and oppress rather than empower. They have considered public participation methods as extensions of social control, tending to produce prescriptive subject positions and delimit public input. From their perspective, participatory processes are abused as token processes to legitimize policy and deactivate scepticism (Chilvers & Kearnes, 2016; Cooke & Kothari, 2002; Cruikshank, 1999; Delgado et al., 2011). Thus lay views are not actually mobilized in real dialogue (Wynne, 2007). As Wilsdon and Willis (2004) have pointed out, processes of engagement tend to be restricted to particular questions, posed at particular stages in research, whereas more fundamental questions about values and vested interests behind scientific practice are not brought forward. PES-scholars, in contrast, have framed public participation as processes of co-constructing publics and issues through participatory processes (see e.g. Chilvers & Kearnes, 2016, Wilsdon & Willies, 2004). This position regards 'the public' or participants as emergent from the relations of the participatory processes; the institutional and political frameworks of public engagement projects. The enactment of public engagement thus entails a production of 'citizenliness' in relation to the enactment of socio-scientific issues, where positions, arguments and identities are defined through the enactment of the matter of concern (Michael, 2012)

I take up the discussion of museums as agents for public engagement, the challenges of participation, and the alleged dismantling of the knowledge deficit model in particular in **articles 2 and 4**, and **sections 2.3 and 2.6**, but they appear as central discussion points throughout the thesis.

1.4 Summary: PULSE and the museum as apparatus of intervention in the social

In my research on PULSE in this dissertation, I draw on the approaches described in this chapter to formulate an STS-based understanding of museums' capacities for producing realities, epistemic regimes and social relations. I build on sociologist Tony Bennet's formulations of museums as civic laboratories; '*technologies that, by connecting specific forms of expertise to programmes of social management, operate in registers that are simultaneously epistemological and civic'* (Bennet, 2005, 522). Museums order relations between objects and visitors, mediate particular forms of expertise, and order and regulate social relations in particular ways. Building on seminal works within STS by Karin Knorr-Cetina (1999) and Bruno Latour and Steve Woolgar (1986), Bennet contends that museums, like laboratories, in their handling of objects and topics, produce processes of abstraction, purification, transcription and mediation. And akin to laboratories, museums '*recast objects of investigation by inserting them into new temporal and territorial regimes*', thus reconfiguring objects and altering social orders (Knorr-Cetina, 1999, 27, in Bennet, 2005, 524). The orders produced by museums enable certain kinds of relationships with and between the visitors, and thereby make new realities and relationships possible. The knowledge and order produced by the museums' systems of classification, like laboratory-produced knowledge, has historically been deployed to mobilize and manage populations. By their assemblage-making activities they can articulate matters of concern and produce or dissolve categories and distinctions. As Bennet puts it: "*museums actively shape the contours of the social within which, once they are mobilized by agents outside the museum, those new realities and relations become active agents in specific programmes of social management*" (Bennet, 2005, 534). The museum can thus be considered a civilizing and epistemological apparatus that produces and intervenes in social order. For instance, by engaging groups and communities and emphasising distinct community positions and experiences, museums not only represent differences, but enact them. In their activities of collecting, displaying and designing exhibitions, museums cultivate and materialize political issues (Bennet 1998, in Knudsen, 2015). Borrowing from sociologists John Law and Wen-Yuan Lin (2009) I take museums to be institutionalized material and discursive knowledge locations. They provide certain legitimately available actions and subjectivities for participants (Law & Lin, 2009:5). Furthermore, with its health promoting agenda, the museum-based health promotion project, such as PULSE, can be considered an attempt to create an intervention in everyday lives. The design process of PULSE, I argue, can be conceptualized as the creation of inscription devices (Latour & Woolgar, 1986,

materializing knowledge, solidifying facts, based on a certain episteme and certain ordering processes or logics that have ontological effects.

I therefore investigate PULSE as such: As an intervention and a knowledge-producing apparatus. I employ the STS conceptualisation of science as a socio-material process which purifies and stabilizes messy and ambiguous data to 'clean' and stable scientific results. I follow an STS-inspired analytical approach in seeking to un-black-box PULSE and health promotion by tracing the relations that are established, the phenomena and matters of concern that are enacted through PULSE. In other words, I study the constituents of PULSE, and its ontological effects.

I use this approach to ask which kinds of power, knowledge, authority and action are produced and distributed in PULSE, and how the project enacts specific problems, target groups and solutions through its design process. Drawing on user studies and public engagement I focus on which kinds of citizenliness or participatory subjects the participatory strategies and codesign setup of PULSE produces. Drawing on a practice based conceptualisation of the everyday, understanding everyday life as practice, constituted by repeated performances, I presume that interventions must engage in tinkering efforts with these repeated performances, alongside addressing and accommodating notions of the good life. My application of practice theory in a health promotion context stresses the necessity to not just provide more knowledge, but also address value-based, material and structural barriers or facilitators for change. A health promotion effort must thus be designed to address the different components of health practices rather than informing and motivating individuals (Cohn, 2014).

Part 2

4 The PULSE Plaza Exhibition, Experimentarium

2.1 Methods, disconcertment and overspills

2.1.2 Theory, methods and collateral realities

This chapter recounts the empirical material and the fieldwork process that form the basis of the dissertation. I have studied the development of methods for health promotion, and the use of museum-based approaches as health promoting methods. To do this, I have employed my own set of ethnographic methods. As mentioned in the introduction, my research is both in and of PULSE. I am thus entangled in the processes and products I study, striving to conduct a double cultural analysis (Jespersen, Petersen, Ren, & Sandberg, 2011). PULSE spans across fields and disciplines, bringing together health promotion and museum practice, uniting researchers and practitioners in participatory design processes. This assemblage has necessitated an approach which could provide tools able to address complexity, work pragmatically, and articulate relations between vastly heterogeneous actors, processes and materials. A stance that can approach the actors indiscriminately, without granting a priory meaning or priority to any of them, but on the other hand does not create the illusion of objectivity or universality.
My placement in the field of Science-and Technology Studies provides me with a certain stance towards the relations between methods and the empirical objects they seek to generate and grasp. A performative approach to knowledge production assumes that concepts are tools to enact particular worlds into being; there is no view from nowhere, as all research is situated and partial (Haraway, 1988). Thus the researcher must relate both to the object of study and the socio-material collective in which she operates (Vikkelsø, 2007). Consequently, the analysis must be reflexive and acknowledge its own contingency. In other words, a performative approach does not take my entanglement in the project as problematic, rather as a prerequisite for any research. An ethnologist of background, I am schooled in particular within qualitative methods and inspired by research traditions, particular fields of interest, and theoretical and methodological discussions within my discipline. They shape my approach, but not by providing a pre-set framework or dogma. With a point of departure in PULSE, I draw on the disciplinary back catalogue, employing notions and arguments from ethnological studies of health, museums and the everyday life, combining with perspectives and discussions from different fields; in in other words, draw on a broad repertoire of resources to grasp, conceptualize and discuss museum based health promotion. My approach is thus highly compositionist (Latour, 2010). This

approach does not assume that methods are neutral tools to uncover reality; rather it takes methods to be theories enacted in practice: "*Methods and substantive findings embed social theories. Indeed, they might be thought of as social theories in practice, theories that go in under the radar to form the social world by generating and reproducing collateral realities"* (Law, Savage & Rupert, 2011, 12).

Working from a post-ANT or performative perspective, conceptualising methods, theory and 'object of study' as neatly delineated and separate entities becomes problematic. Deriving research questions from theory, with methods as tools to test these questions 'in reality' is a division of labour that does not correspond with the messy world of social enquiry (Law et al, 2011). Considering methods as tools that uncover a reality existing 'out there' reduces methods to tools that might, if employed the right way, represent reality correctly. This presumes a binary divide between the reality 'out there' and our methods. Taking a performative approach implies embracing the social nature of methods; recognizing that methods are *of* the social world, being imbued with theoretical renderings of the social world, embedded in institutional ecologies. They are, in other words, *constituted by* the social world. They carry with them implicit assumptions about the world, the phenomena and actors they study, and they have performative effects: they *constitute* the world in a certain way. Methods are thus ways of bringing certain realities into being, through the practices of getting to know those realities (Law & Singleton, 2005). Methods have histories and ecologies; they have come into being for specific purposes, and with patronage of certain actors; scientific disciplines, institutions, and often the state (Law et al, 2011). Methods have often served the purpose of rendering populations manageable, study-able, shaping certain kinds of study objects by the ways they study and handle them (Damsholt & Jespersen, 2014). In their implicit assumptions about people, methods tend to foster certain subjectivities. For instance, assuming that consumers are rational choosers with attitudes based on norms and morals about right and wrong when shopping for certain goods, and that this can be uncovered by surveys and interviews (Law et al, 2011). The methods are active in producing the social; phenomena, people, and ways of knowing. They carry hidden assumptions and implicit renderings of the world that constitute what John Law calls 'collateral realities'(Law, et al, 2011). With the recognition of the performative effects of social research, we move into what Annemarie Mol calls ontological politics (Mol, 1999). If methods carry the power to constitute social worlds and subjectivities, we need to scrutinize and consider which social realities we are producing, and whether we can or should do it differently: Which realities do we help come into

being? So we need to ask, what is implied and assumed in a given method. The reality-making effects of methods point to the importance of studying the processes of knowing, studying what is made knowable, how it is made knowable, what the implications are for the realities that are produced, and what eludes this analysis. This entails letting go of a priori conceptions about what things are. Instead, the task becomes to study the processes of becoming of, say, phenomena, technologies, or methods, and to analyse the consequences hereof. To point to, which realities are made, how actors are constituted, which ontologies are produced or which epistemologies are favoured.

2.1.3 Disconcertment and overspills

To come closer to the meanings of such situations, where things do not turn out as planned, I turn to Helen Verran's conceptualization of '*moments of disconcertment*' (Verran, 2001). Based on encounters with an African logic of calculation that does not fit with a Western counting system, Verran describes moments of disjuncture and mismatch as moments of disconcertment: Experiences of epistemic disaggregation that, at first encounter, might seem like inconspicuous moments of unease, where the feeling emerges that 'something is amiss'. Verran encourages investigating the dynamics of this disconcertment, as these mismatches and ruptures might signify bigger issues. Rather than being brushed off or explained away as merely an awkward moment or a misunderstanding between individuals, the moment of disconcertment should be taken seriously, as clue to where a useful critique might be provided (Verran, 2001) and investigated for its context and the world that lies within it (Law & Lin, 2009:4). Along this line of thinking, I mobilize the notion of moments of disconcertment to use such moments as detectors of difference (John Law & Lin, 2010). This concept enables me to focus on such situations, of which there were quite a few in the course of the project. These were situations that ranged from a slight sense of discrepancy, not noticed by anyone but myself, to more conspicuous clashes or ruptures, where the processes and flows of the PULSE project seemed to come to an abrupt halt. These were often the most uncomfortable moments, which one tends to want to move away from as quickly as possible. I try to linger in these moments of disconcertment, and examine what caused this interference. This includes being explicit about the personal and methodological story of being an ethnographer and researcher in the project. To come closer to how such moments can be analysed, I turn to sociologist of science and technology Mike Michael. In his account of a number of science engagement events that 'go

wrong', he discusses how this failed attempts of public engagement 'overspill' the empirical, analytical or political framing of the engagement event (Michael, 2012). He describes cases where the intended target groups for public engagement in different ways resist, refute, mock or ignore engagement attempts, thus challenging the premises for the engagement work. Typically, these kinds of 'misbehaviour' are sanitized and ignored as failures, irrelevant and based on singular cases of uncooperative or unserious persons. But instead, Michael argues, they can be seen as 'a rumbling of the repressed'; a resistance of the engagement agenda and format, which raises serious questions about the social scientific interventions (Michael, 2012).
The articles in this dissertation are spurred by situations or processes that evoked this sense of disconcertment.

2.1.4 Empirical field: PULSE in- and outside of the science centre

I consider the fieldwork with the families in Husum and Hellerup as empirical material alongside the project process and methods in PULSE. The families, the neighbourhood actors and structures, the designers, the science centre setting as well as the Steno research agenda are all considered part of the assemblage that is PULSE and the process that enacted a particular kind of health promotion alongside its target groups, health as an issue, and the museum setting as the solution. Therefore my story regards all of these different actors. I therefore employ a wide range of heterogeneous materials: Exhibitions, websites, project reports, observations, interviews, conversations across an office space, being together over lunch, conference participation, etc. Most of it I have composed myself, but there is also auto-documentation, second-hand descriptions of events, and materials produced in collaboration with CTS. This was necessitated by the fact that the PULSE project stretched over several years, and had many activities, and I was not able to be in all places at all times. The material is heterogeneous, and my route through the project was not a linear progression, but rather somewhat erratic, characterized by constant efforts to knit things together, to connect and compose something approximately coherent. I was largely dependent on the design and development process at Experimentarium, and had to plan my work around it. The process was, rather than a neatly planned and executed one-site fieldwork, an 'art of the possible' (Hannerz, 2003, 212), where I both participated in the process, studied it, switched between design sessions, interviews and recruitment, reading and writing. As such, the process was very far from the '*phantasmagoria of the Evans-Pritchard style fieldwork*' from the classical anthropology, where the anthropologist conducts intensive fieldwork in the

same setting over a long period of time (O'dell & Willim, 2011). A number of activities and materials I gathered were never put into use, and some did not take the shapes I expected. Most significantly, my focus grew out of the frictions, overspills and moments of disconcertment I experienced in the process, and so my initial ideas about the dissertation's focus were very different from what became pertinent to me through the process.

In the next section I will provide an account of the methods employed in my project, before I in following chapters recount and reflect on the application of the methods and the outcomes of my engagement in PULSE, delving into the activities and dilemmas of creating a codesign process, generating knowledge with and about the target groups, and facilitating inclusion of the underserved users while designing a health promoting exhibition and outreach. Each section takes up part of the process, and is each focused on a certain moment – or process – of disconcertment sprung from this process, and the analytical work I performed to investigate and try to grasp these occurrences.

For a compiled list of the empirical material of the thesis, see **appendix 2.**

5 One of the internal PULSE project workshops

2.1.5 Literature study

2.1.5.1 General literature: health promotion and museum education in theory and practice

As the first step of the PhD project I conducted an extensive literature search on relevant topics in relation to museum-based health promotion, family and intergenerational health promotion, child and family studies, science center and museum learning, health promotion methodology and values, action research, participatory design and science didactics. It also comprised practice theory, user studies, science- and technology studies, social studies of science and health, actor-network theory, health technology and digital anthropology. The literature was sorted via a read of titles and abstracts, followed by thorough reading. The result was a vast body of literature, which was collected in a PULSE library database for the use and reference of all project participants. The database was continuously updated and expanded via snowballing (Streeton, Cooke & Campbell, 2004). It was furthermore supplemented with relevant literature from the PhD courses I attended, and recommended literature from colleagues and network.

2.1.5.2 Scoping study: health promoting exhibitions

As described in Christensen et al (2016) as a part of the PULSE project I conducted a scoping study on health promoting exhibitions which was drafted into an article written in its final form by Julie Hellesøe Christensen (et al). The scoping study methodology allowed for the combination of published and grey literature to be reviewed and analysed in order to identify the state of knowledge on the area of health promoting exhibitions, and define knowledge gaps (Arksey and O'Malley 2005; Daudt et al. 2013; Christensen et al, 2016; Levac et al. 2010). The scoping study thus compiled the (limited) published literature and reports, webpages, evaluations and other material that we could either find via the use of several major databases, by searching on major museum journals, scouring museum homepages, or by receiving from museums on our request. We focused on English-language exhibitions, therefore mainly at European and American museums. We analysed the material with both a descriptive summary and a thematic content analysis (Christensen et al, 2016; Levac et al, 2010).

2.1.6 Fieldwork: Husum and Hellerup

The first stage of the development process was an ethnographic fieldwork in the two neighbourhoods of Hellerup and Husum about family everyday life and health practices (Kaijser & Öhlander, 1999). We aimed at employing qualitative methods that involved the whole

household, in their home, in order to get insights about the families and their practices in their context. The fieldwork was intended to inform the design process, by providing insights on the everyday life and health practices of the families. The first stage was very explorative, in order to gain an understanding of notions and practices of health amongst the target groups, as well as the family relations and dynamics regarding health and physical activity. The material generated from the fieldwork was intended to serve as an empirical knowledge base on the everyday life of the informants, providing a starting point for the development work of both exhibition and the Associated Activities at the PULSE project.

Participants were recruited via advertisements in local newspapers, posters and communication through the local housing association and neighbourhood renewal project secretariat, who also helped recruiting via networking, and snowballing (Streeton, Cooke, & Campbell, 2004). Inclusion criteria were: Families (one or more caregivers) with at least one child aged 6-12, with the postal code 2700 (Husum-Brønshøj) or 2900 (Hellerup). During the first contact with the families they were asked about their educational level, job and marital status, based on which we tried to sort the families to have a broad range of families represented. In all, 22 families were included in the study involving more in-depth methods; interviews, visual/tactile methods and/or workshops, 15 from Husum-Brønshøj and 7 from Hellerup. Some families were involved via several methods, as they participated in both interviews and workshops and other events. Additionally, many more families participated in observations, X-bus, vox-pops, and so on, but without being registered as named participants.

The fieldwork was conducted jointly by CTS and I, collaborating on the design and preparation of the fieldwork, performing joint coding, analysis and discussion of the material, and joint publications. Therefore we have an amount of shared material. For practical reasons we could not both be present at all interviews, but nevertheless consider interviews and design workshops shared material. After the first stage of the fieldwork (Winter/Spring of 2013), CTS followed the exhibition design team and I the Associated Activities design team, wherefore our empirical material and methods were separate from there on. I continued the fieldwork in Husum as my research themes centred on the inclusion and participation work there, wherefore I have more material from Husum than Hellerup.

2.1.6.1 Observations in Husum

I performed observations in the Voldparken area of Husum in several rounds, during different seasons and times of day, to gain impression of the place, its atmosphere, patterns of use and social interactions (Spradley, 1980; Tjørnhøj-Thomsen & Whyte, 2008). This was documented via notes and photos. I furthermore performed observations at local events that either were focused on physical activity or had been singled out by the local stakeholders as especially popular or significant activities. This included observations at the FerieCamp (Holiday Camp) activities for children during the winter break in 2013, held at the EnergiCenter Voldparken, a local, closed school turned into the headquarters of the Area Renewal Secretariat, the Volunteer Association, and thus the hot-spot for activities in the area; a place which I visited repeatedly to observe. I also participated with observations in the community Ramadan celebrations and the 2700-community run, and at a workshop held as part of the area renewal project, where residents were invited to participate in the design of the future green areas of the neighbourhood (see also **article 2**).

6 EnergiCenter Voldparken, the hub for activities in Husum

2.1.6.2 Qualitative family interviews

The interviews were loosely structured by an interview guide, focusing on the everyday routines of the families, family time, physical activity and health perceptions and practices (Halkier, 2008; Spradley, 1979; Staunæs & Søndergård 2005). During the course of the project, the interview guides were edited and adjusted according to the project phase, emerging research themes and the situation and abilities of the families. Therefore, the interviews reflect the ongoing dialogue I strived to create between methods, theory and analysis.
We encouraged discussion amongst family members, but largely let the family dynamics unfold without interference, so that when children needed to leave the table or parents had to serve snacks, find toys or moderate a quarrel, the interview either paused or continued with the remaining family members. Interviews took typically 1 ½ - 2 hours. All interviews were recorded and transcribed verbatim, followed by a thematic coding and analysis (Braun and Clarke, 2006), which was discussed in the research group. The participants were subsequently asked if they were willing to participate in codesign workshops for the design of the PULSE exhibition and outreach activities, and many agreed. They were contacted when the workshops were planned, and selected according to their ability to attend on the planned dates.

7 The author performing a family interview

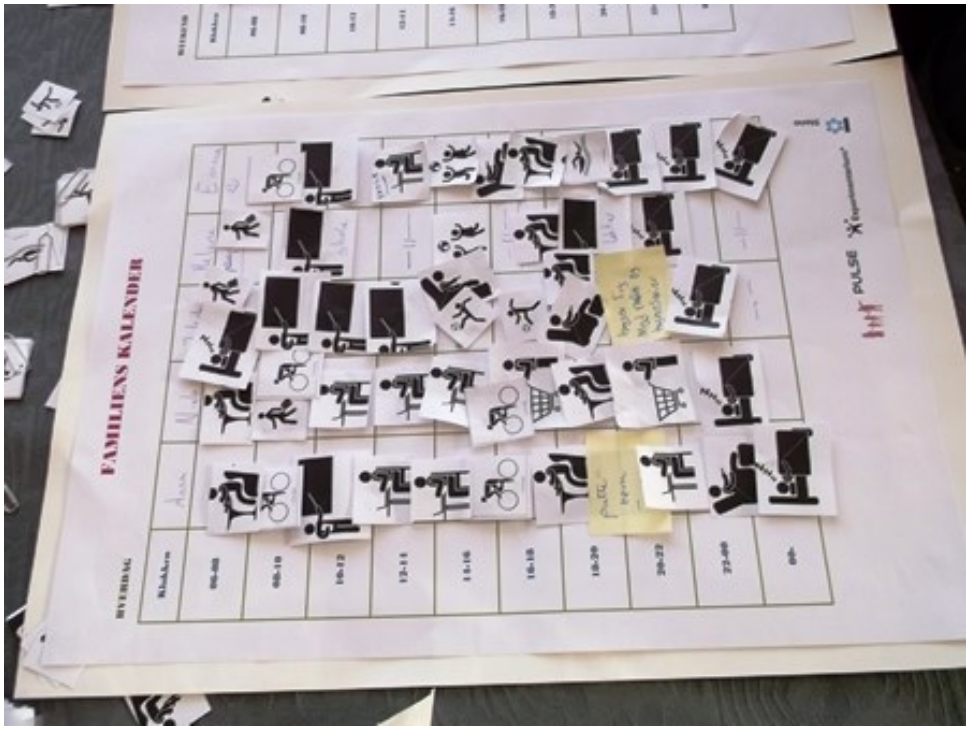
2.1.6.3 Qualitative interviews with professionals

Qualitative interviews were conducted with the members of the housing associations' social efforts ['Den boligsociale indsats Husum for Alle' henceforth HFA] about the range of existing activities and the resident's participation, experiences and challenges regarding the residents' health status, wellbeing and social issues. The interviews were loosely structured by an interview guide, recorded, transcribed verbatim and coded thematically (Hammersley & Atkinson, 2007; Spradley, 1979; Clarke, 2003). Furthermore, semi-formal meetings were held with members of the area renewal secretariat (Områdefornyelse Husum), the municipal health centre (ForebyggelsesCenter Vanløse; henceforth FCV) and the Volunteer Association, documented via notes. These focused on the health-related and social activities that had already taken place in the area, including the project Klar-Parat-Husum (Østergaard, Nielsen & Borg, 2013).

2.1.6.4 Visual and tactile methods

The families were asked to use cultural probes in the shape of calendar and photo exercises (Gaver, Dunne, & Pacenti, 1999; Hammersley & Atkinson, 2007; Spradley, 1979; Tjørnhøj-Thomsen & Whyte, 2008). The probes provided a starting point for household interviews about everyday activities and routines (Pink, 2012; Spradley 1979). They enabled us to get insights beyond the spatially and temporally limited interview session (Pink, 2006; White, Bushin, Carpena-Mendez, and Ni Laoire, 2010). Furthermore, they had the aim to enable reflection on otherwise mundane and taken-for granted topics, and to not favour only verbal representations. This was especially important when involving children, and in situations where language difficulties impeded the conversation. Here the visual aids helped to have more tangible points of departure. The families were given cameras for a week, with the task of having each member bring the camera with them for at least a day, and take pictures of physical activity of any kind in their everyday life. With point of departure in the photographs, the interview guide was supplemented with questions about the motives and meaning of the families' specific photos, and the family members were each asked to tell about their photos and what they represented. During the interview session, the families were also asked to do a calendar exercise, where they mapped the activities of all members for a typical week. This was in the first part of the fieldwork that was jointly conducted; in the second part of the fieldwork which I conducted alone, focusing mainly on Husum, the calendar exercise was replaced by a mapping exercise, as part of the Associated Activities design process specifically focusing on events that increased participation

amongst the residents in Husum. Here the families were asked to draw and tell about their favourite places, routes and hotspots for social and physical activity on maps of the neighbourhood. However, in some cases, the calendar or the mapping exercise was omitted, because of language difficulties which prolonged the interview, or because it was deemed too challenging to gather the whole family to assemble it.



8 The family calendar exercise

2.1.6.5 The Health Network meetings

The Health Network was founded as part of the PAA engagement in Husum, as the PAA team repeatedly held meetings with the numerous local stakeholders and discovered a number of related interests across these stakeholders, but a lack of communication and coordination. As a result, the bi-monthly meetings were initiated, where members of the PULSE team met with representatives from the municipal health centre, the Area Renewal Secretariat, the Local Committee Secretariat, the Volunteer Association, HFA, and the Health- and Care Department of the Municipality of Copenhagen, to share experiences and coordinate activities and interests in the area. The network continued its meetings throughout 2014-15, and I participated whenever possible, documenting via notes.

2.1.6.6 Gentofte meetings

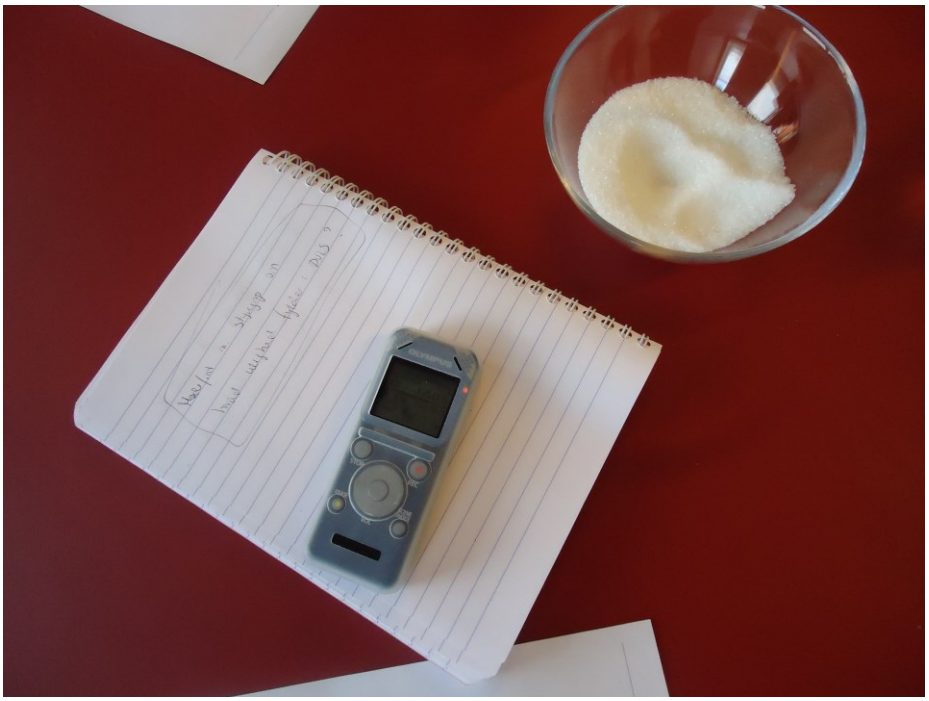
The PULSE team collaborated with the municipality of Gentofte, department of Prevention and Health Promotion [PHP], about the fieldwork in Hellerup. PHP had similar interests in generating knowledge about the health and physical activity of the citizens of Gentofte, and the possibilities for creating activities promoting health in the area. We therefore held continuous meetings, exchanging knowledge, and presenting preliminary results for the PHP team. This was documented with notes, presentations and minutes saved as data.

2.1.7 PULSE development process

The codesign process was split into two strands; one mainly involving the 'super-users' in exhibition design, and one building on the work with the Husum-area in the outreach and local activities development (more on this in the next section). The process was documented by notes, minutes, video- and audio-recordings and photos, and all process documents and materials were saved as data. The recordings were transcribed verbatim, coded and analysed thematically (Braun and Clarke, 2006), and the themes were discussed repeatedly in the research group.

2.1.7.1 Experimentarium and PULSE staff interviews

I performed qualitative interviews with the project managers of PULSE and the management of Experimentarium regarding the process, goals, outcomes and challenges of the project, loosely structured by an interview guide (Hammersley & Atkinson, 2007; Spradley, 1979). The project managers were interviewed twice; halfway through the project, and towards the end. Interviews were recorded, transcribed verbatim, coded, and subjected to a thematic analysis (Clarke, 2003).



9 Recording a PULSE workshop

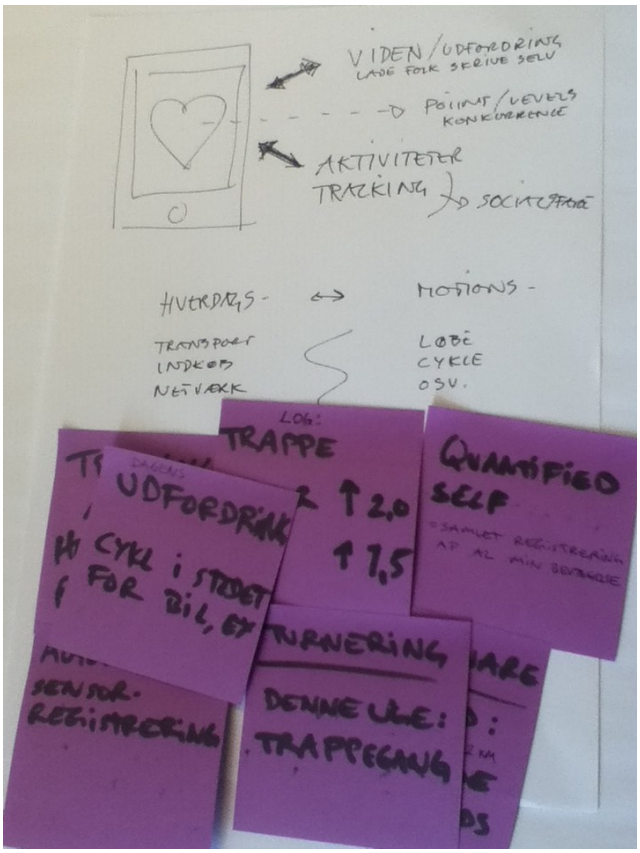
2.1.7.2 Workshops

The insights from the fieldwork were analysed for recurring themes and used as an onset for the design workshops. The exhibition codesign process consisted of three workshops where the participants were asked to provide input to ideas, concepts, mock-ups and prototypes, based on the use of design games (see also **Article 3** and Sandholdt & Ulriksen (forthcoming) for in-depth descriptions of the methods). The two first workshops were arranged and facilitated jointly by the designers and CTS. These were video-recorded and subsequently transcribed, coded, and analysed collaboratively CTS and the designers. Both workshops were based on a design-game approach (Brandt, Messeter, and Binder, 2008; Halse, 2008). The families were separated into smaller groups for the different stages of design exercises in each workshop, and children and adults received tasks on levels according to their age groups. In the first workshop, families were introduced to a customized board game representing their home environment and board pieces depicting the family members, quotes from their interviews, and photos related to physical activity, based on the materials and insights from the fieldwork. They were then asked to use the board game to tell stories about their family needs and preferences in relation to an experience that incorporated physical activity, and discuss what would accommodate their different needs.

They were presented with the designers' ideas for designs, and asked to imagine using them, and to select, elaborate and prioritize their favourite idea. Then they were asked to enact a small play about the family going to Experimentarium to visit the PULSE exhibition, and then discuss what they would achieve from it.
Following the workshop, researchers and designers jointly analysed and discussed the material, adjusting ideas according to the user input, and prepared the next design steps. In the second workshop, the families used LEGO and idea generation picture cards to define design principles for the exhibition, for instance atmosphere and narratives. After the workshop, designers worked to develop and refine the most promising ideas – based on a balancing between the participant's and the designers' favourites and considerations for feasibility.
In the third workshop, the families were presented with these concrete ideas and asked for their input and critiques. The workshop was documented with notes. The final curating was performed without involvement of the families. Some technical tests were performed in the exhibits before the official opening of the exhibition, and in a relocation of exhibition a year after the opening, minor adjustments were made to the setup and technical use of the exhibits (such as replacing RFID-technology with email-based login-functions to the exhibits) (For an analysis of the design stages and the concrete design decisions emanating from this, see Thiel Sandholdt and Ulriksen (Forthcoming).

The Associated Activities design took place via two workshops and a 'fieldshop' (on-site workshops), also employing design games (Brandt et al, 2008; Halse 2008). The first workshop was attended by project team members, digital designers and consultants, and the second workshop by members of the health network, local stakeholders and volunteers, i.e. the Area Renewal Secretariat, the FCV, municipal consultants, teachers and HFA. The workshops generated general design principles and concrete ideas for 1) the digital outreach, i.e. the mobile application 'the Pocket Dog', and 2) the locally based activities, resulting in the elaboration on a pre-existing community run; the 2700 run (a run named after the postal code of Husum) and the creation of an agility course for humans, thus uniting the application with the physical environment of the run. Between the two workshops, the mock-ups were tested and elaborated by a family in a fieldshop; a double-session workshop where team members and digital designers drafted ideas based on the insights on the fieldwork, and then took the mock-ups home to a

Husum-family to test in the proper setting. The results were subsequently discussed in the Associated Activities team.



10 Associated Activities design workshop

2.1.7.3 Xbus

The Xbus was a community nights-program running 2013-15, where residents from Husum were offered free visits to Experimentarium. The event was held 3 times between 2013 and 2015, each time with more than 100 participants. The event was advertised and arranged in collaboration with the local housing association that organized registration and accompanied the residents. Since the events were large, with many participants spread over the exhibition halls, the PULSE team collaborated on gathering data. The PULSE team researchers took photographs and performed participant observations (Spradley, 1980), and afterwards shared photos and notes, and discussed the material. At the second Xbus event, two Master Students performed vox-pops, based on questions that we had produced together. The interviews were audio-recorded and transcribed. I could only by present at the second Xbus event, for practical reasons, but had access to the shared documentation, and subsequently discussed the events thoroughly with the team, based on the existing material.

11 Interview during an Xbus event

2.1.7.4 PULSE meetings, seminars and collaboration

Throughout the PULSE project process, there were numerous meetings, workshops and seminars, where process planning, knowledge exchange, communication of results and other relevant research and projects took place. I participated in these to the extent possible, and documented via notes and minutes, photos and recordings, when possible. Furthermore, my field diary, project correspondence, project notes, sketches, presentations and other kinds of written, visual and tangible material was saved as data and documented the daily work, communication and interaction of the PULSE team, alongside my own reflections on the process and the progress and changes of my project.

10 PULSE development workshop

2.1.8 Exhibition studies

In March-April 2015, I went to the US to visit health promoting exhibitions at children's museums and science museums selected based on the initial literature search and scoping study (see also **Article 4**). The exhibitions were selected because they spanned across different audience groups, and represented different aspects of health from physical activity and cardiovascular health, to diet, safety and disease prevention, using different means of communication. They were thus selected to represent different formats for health education in a museum setting. I employed qualitative fieldwork methods; interviews, observations and conversations (Hammersley & Atkinson, 2007; Spradley, 1979; Tjørnhøj-Thomsen & Whyte, 2008). Where possible I met with directors of exhibitions, education and outreach programs to discuss their health promoting exhibitions and programs. The meetings were informal, my questions being based on loosely structured themes, and documented via notes. They were supplemented with a walk and talk in the exhibitions in question. I furthermore conducted

participant observations in the exhibitions; trying the exhibits, reading the texts and interacting with other visitors where it felt natural. I observed the use of the exhibitions, the interactions of visitors with each other and the exhibitions, and took notes, photographs and brief videos. Many of the museums also provided online learning material, which were included as data material. To see the exhibition visited, see **appendix 2.**

11 Boston Children's Museum, where part of the fieldwork was conducted

2.1.9 Summary: Engaging with the practical ontologies of health promotion

I employ my STS- and performativity inspired approach to investigate the health promoting methods employed in PULSE, the forms of knowledge and strategies mobilised to engage the target groups, how the target groups are made knowable, and the collateral realities, subjectivities and ontological norms that are enacted through this process. My task, then, becomes to pay attention to how diverse elements/actors in a situation, such as researchers, designers, methods, families, science centre and health discourses collectively enact health promotion at the science centre in a specific way. That is engaging with the practical ontologies

(Jensen 2004) of health promotion. This also means that this dissertation is not a straightforward story about how I employed a set of methods to my designated empirical object, but rather a story about trying, failing, seeking explanations, changing approach, and adjusting focus.
The empirical material that forms the backbone of the thesis is consequently vast and heterogeneous, consisting of qualitative fieldwork in the areas of Husum and Hellerup, and of my participation in the PULSE project. I have 'classic' ethnographic' material such as interviews and observations, alongside project material of many kinds, including project documents, mock-ups, and my own documentation of the process. I have selected and engaged with materials based on the structuring of the thesis around significant moments of disconcertment and the processes that surrounded these moments. In the following sections I unfold and analyse these moments of disconcertment, attempting to pinpoint the epistemic disaggregations that cause them, reading them as frictions between institutions, professional fields and knowledge forms. Moments of disconcertment can be where all these levels of difference entangle. I try to explore them on different levels. What is causing the friction? This means I take an approach that is intensive rather than extensive: Assuming that large issues can be detected in specific practices; that the whole can be found within (Law & Lin, 2009, 3). I will delve into these moments of disconcertment and unfold how I used them to create my analytical themes of the thesis in the following chapters, which regard the different places, stages, and methods of the PULSE project.

2.3 Health practices and household collectives

2.3.1 A tale of two neighbourhoods

In this and the following two sections, I recount and discuss the fieldwork I performed in the areas of Hellerup and Husum, and the development process in PULSE which took place alongside my fieldwork – indeed formed part of my fieldwork. In the course of the fieldwork I experienced several moments – or even prolonged periods – of disconcertment, both personally, and collectively, as part of the PULSE team, based on the challenges and unexpected turns along the way. In each of these chapters I investigate these moments, which from my dwelling upon them grew into analytical fields. The moments overlap and are related, as they spring from entangled processes, so my distinctions and analytical cuts here are, of course, matters of composition. The reader will therefore experience some overlap and recurrences in my recounts, as I revisit scenes and sites which spurred the disconcertment, and as I so to speak, follow the flows of the overspills in different directions.

The initial intention was to do two parallel strands of fieldwork in Hellerup and Husum, providing a base of knowledge that would launch the project into an informed development process, building on the insights about the families. The families who had participated in the fieldwork, would be our 'PULSE families', with a special affinity to the project, working alongside the scientific and development staff to coproduce the elements of PULSE, ultimately seeing themselves represented in, and addressed by, the design products. The project thus built on existing user groups, but also aimed at growing new audiences through the enrolment and attachment of users. However, instead of being parallel, the two strands were shifted and displaced. They had different foci and different methods. They perform two different modes of ordering, interacting and investigating. [15]It became clear to me, that different performances took place; that different kinds of participation, and different challenges for health promotion were

[15] It is important to remark, that the study in the two areas was never meant to be comparative. I do not take all the Hellerup families to be of the same kind and thus representing a specific target group type. Neither do I take all the Husum families to be similar. But the two different modes of fieldwork enact differences that I think are significant.

enacted. The assemblages that were made, the situations that were created, enacted different issues that spoke to our venture in different ways and posed different questions.

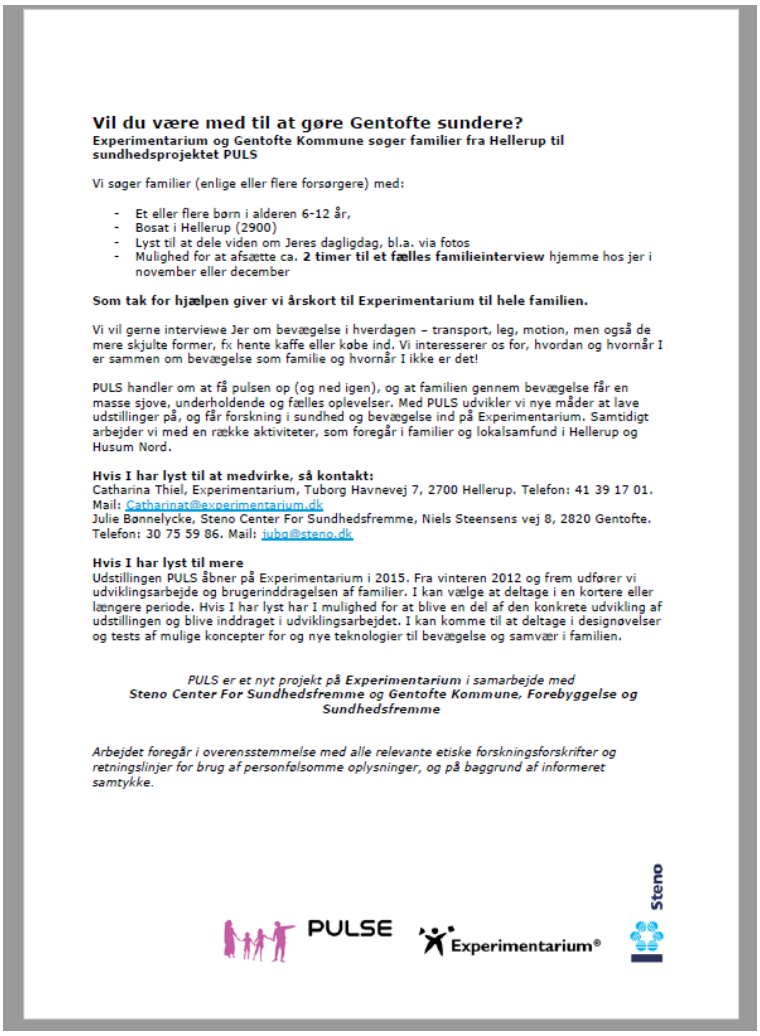
2.3.2 Hellerup: The 'super-users'

Hellerup is an area in the Municipality of Gentofte (Gentofte Kommune), in the Danish Capital Region (Region Hovedstaden). The area has a population of 19.197 per 1/1-17. The municipality of Gentofte has the highest income tax base pr. person in the Capital Region, and the highest average disposable income per person. Real estates in the municipality have the highest average price in the region, and 67 % of dwellings are privately owned[16]. Furthermore, the percentage of people with other ethnic backgrounds than Danish is lower than national average, and employment rates and educational levels are higher. It is generally considered an attractive and exclusive area to live in, with an abundance of cultural and leisure activities, green areas, sailing opportunities and high-end shopping.

In sum, Hellerup can largely be characterized as an affluent suburb with mostly socio-economically advantaged inhabitants. Experimentarium is situated at Tuborg Havn in Hellerup, and receives regular visits from the Hellerup schools and institutions, and the Hellerup inhabitants form a good part of the visitor numbers. They are considered the habitués of Experimentarium, and thus provide a kind of visitors that the Experimentarium is familiar with. They were as such cast as a kind of 'super-users', who, in opposition to the Husum citizens, were not 'problematic' in terms of attendance. They were, however, still framed as harbouring the potential for improvement of lifestyle. This, in itself, being appointed by the project as presumably healthy, but not healthy enough, evokes a sense of the inherent problematization of target groups that is the backbone of (health or other kinds of) innovation. A problematization that was readily accepted by the families, as can be seen from their response to our efforts.

To recruit participants in the project, we posted an advert in the local newspaper, Villabyerne.

[16] Source: http://www.gentofte.dk/da/Om-kommunen/Gentofte-i-tal/Statistikker



Vil du være med til at gøre Gentofte sundere?
Experimentarium og Gentofte Kommune søger familier fra Hellerup til sundhedsprojektet PULS

Vi søger familier (enlige eller flere forsørgere) med:

- Et eller flere børn i alderen 6-12 år,
- Bosat i Hellerup (2900)
- Lyst til at dele viden om Jeres dagligdag, bl.a. via fotos
- Mulighed for at afsætte ca. **2 timer til et fælles familieinterview** hjemme hos jer i november eller december

Som tak for hjælpen giver vi årskort til Experimentarium til hele familien.

Vi vil gerne interviewe Jer om bevægelse i hverdagen – transport, leg, motion, men også de mere skjulte former, fx hente kaffe eller købe ind. Vi interesserer os for, hvordan og hvornår I er sammen om bevægelse som familie og hvornår I ikke er det!

PULS handler om at få pulsen op (og ned igen), og at familien gennem bevægelse får en masse sjove, underholdende og fælles oplevelser. Med PULS udvikler vi nye måder at lave udstillinger på, og får forskning i sundhed og bevægelse ind på Experimentarium. Samtidigt arbejder vi med en række aktiviteter, som foregår i familier og lokalsamfund i Hellerup og Husum Nord.

Hvis I har lyst til at medvirke, så kontakt:
Catharina Thiel, Experimentarium, Tuborg Havnevej 7, 2700 Hellerup. Telefon: 41 39 17 01.
Mail: Catharinat@experimentarium.dk
Julie Bønnelycke, Steno Center For Sundhedsfremme, Niels Steensens vej 8, 2820 Gentofte.
Telefon: 30 75 59 86. Mail: jubo@steno.dk

Hvis I har lyst til mere
Udstillingen PULS åbner på Experimentarium i 2015. Fra vinteren 2012 og frem udfører vi udviklingsarbejde og brugerinddragelsen af familier. I kan vælge at deltage i en kortere eller længere periode. Hvis I har lyst har I mulighed for at blive en del af den konkrete udvikling af udstillingen og blive inddraget i udviklingsarbejdet. I kan komme til at deltage i designøvelser og tests af mulige koncepter for og nye teknologier til bevægelse og samvær i familien.

*PULS er et nyt projekt på **Experimentarium** i samarbejde med*
Steno Center For Sundhedsfremme og Gentofte Kommune, Forebyggelse og Sundhedsfremme

Arbejdet foregår i overensstemmelse med alle relevante etiske forskningsforskrifter og retningslinjer for brug af personfølsomme oplysninger, og på baggrund af informeret samtykke.

PULSE Experimentarium® Steno

12 The recruitment ad from Hellerup

On the day of publishing the advert, we received so many phone calls from prospective participants that we had to put a number of them on a waiting list. We had more than twice as many prospective participants as we needed. Families were selected in the attempt to cover as many different family types as possible; single-parent, same-sex parents, different ethnic and social backgrounds. Variances in families participating from Hellerup were however minor. At the appointed day and time, I would come to their home to conduct the interview.

2.3.3 Household collectives

Many children's museums and science centres have a water-flow exhibit, and they are generally quite popular: Children (at all ages) can splash around, get their clothes wet, and experiment with floating objects like rubber ducks and toy boats down a stream, where various streams, sluices

and obstacles can be manipulated to create new flows, block or redirect the stream. Visitors often arrange impromptu races, as one person inserts a duck that, bobbing and spinning, flows down the stream, while other persons try to either block its way or free its flow. Sometimes several ducks are inserted at once, racing in different routes down the stream to end in a whirl at the end. I very often experienced the PULSE family interviews in a similar manner. I struggled to hold on, riding the flows, and parents tried to direct streams, help 'the duck', whereas children (sometimes adults, too) would continuously throw different objects in the water and enthusiastically watch the new ripples they created. All this on a ticking clock; the interviews being placed between end of working hours, and before dinner and bed time, with a certain amount of pressure to keep tired and hungry children reasonably cooperative and get dinner on the table before pandemonium would erupt. The hectic hustle and bustle of the interview setups mirrored the content of what the families recounted: Busy, stressful lives, with schedules crammed with work, school, activities, family outings and logistics. With never quite enough time, and so many things needing to be done. These sessions were at once very diverse, and yet had a distinct pattern – a pattern of semi-structured chaos and busyness, with constant efforts of managing and juggling this heterogeneous, not-singular entity of the household. I had the distinct sense of the efforts it took to coordinate, choreograph and hold together these assemblages of members, stuff, activities, places, discourses, anecdotes and much more. With parents talking about childhood activities, and how they would like to imprint their childhood interests to their own children, recollections of past vacations and excursions, musical instruments they played, pets and favourite toys. Many times, places, actors, ideals and emotions were present at the same time, enacting a lot more stories and issues than merely about physical activity.

This grappling with heterogeneity and trying to mobilize a target group which was always shifting, moving, being made and kept together might be considered primarily a methodological point about the challenges in doing research with families. To me it pointed to something else: The ontological premises for an intervention agenda, and the conditions for doing health promotion and changing everyday lives and practices. The fieldwork did not surprisingly depict complex and entangled practices. And the stories of this complexity we generated raised the familiar question of how to create interventions in this complexity.

Mike Michael recounts a number of experiences for public engagement attempts that turned out 'different'; where people did not provide the kinds of answers sought for, or behave in the manner requested. He coins these moments as overspills; of resistance and mismatch (Michael,

2011). It appeared to me that my methodologies were likewise trying to enact an order and a structure that encountered resistance; seeking to impose order and asking questions that perhaps were working on a different frequency than the intended target groups. That the answers that came back to me were cacophonous and not answers at all, but rather enactments, not only of physical activity, but of familyness, of everyday lives in collective units. The interviews revealed glimpses of the efforts and struggles to hold everything together, of the careful orchestration of everyday lives and relations, ideals and norms, practical issues, desires and identities. The impression left me by the interview sessions were of grappling with a heterogeneous and polymorph entity that was, as put by Mol 'more than one, less than many' (2002:55); an entity where one person cannot be singled out to be the appointed target for health promotion, when everything said, done, valued, experienced and achieved, is so clearly achieved (and at the same time greatly complicated by) collective efforts. Australian anthropologist Sarah Pink has provided thorough studies of the interwoven and complex practices of domestic life (2004, 2012). She suggests understanding the home as an ecology of interrelated practices, discourses, materiality and energies through which homes and self-identities are continually co-constructed. She emphasizes that everyday decisions within the domestic sphere are based on the weighing up of different structures, relationships and intersecting practices. And most importantly, not all actions are based on rational deliberation and decision-making, but also consist of habits, tacit knowledge and values. The daily practising of a good and healthy family life is a matter of compromises and navigating between other factors of structures, relationships and other practices (Pink 2012). Therefore, practices of health and physical activity must be considered in relation to practices of family life, work life, parenthood, and more. As Pink argues, homes are nodes for numerous practices, as they are the hub of everyday activities of family members. I mobilize these lines of thoughts to suggest that this density of related practices creates a stable, yet fluctuant assemblage: a collective that can be the target unit for health promotion. By the actions and practices that continuously intersect and entangle in the homes, they become the centre of co-ordination where multiple components are brought together: Heterogeneous actors, activities, materiality and discourses (Löfgren, 2014). The household collectives are produced by, and producing practices. This provides the basis for a care-based, tinkering approach addressing collectives, rather than a choice- and behaviour-based, individual approach (Mol, 2002). In **Article 1**: ***Household Collectives, Resituating health promotion and physical activity***, we elaborate this and suggest a reconceptualization of the target for health promotion

which moves the focus from individuals to their embeddedness in socio-material collectives. Collectives that are held together by continuous efforts to align interests and coordinate activities, and which are never homogenous, and stable, but exist because of their slowly change through repetition and shifts in practices.

2.3.4 "You can ALWAYS optimize"

The families we encountered in Hellerup were generally quite physically active, often biking to and from work and school, attending organized sports or fitness centres. They weighed exercise and healthy diet highly, and aspired to do as much exercise as possible: there was a general agreement that 'you can always do more'. They were knowledgeable about health recommendations, and highly reflected about their motivations, challenges and room for improvement. They did, however, also express frustrations about the incompatibility between high ambitions for both career, exercise, and social and family life. Their challenges were in other words not regarding health knowledge and motivation; on the contrary, they expressed desires to be healthy and active, but often felt that the practical arrangement of their everyday lives prevented them from getting the amount of exercise they wanted. Or that exercising would entail opting out on things they did not want to neglect. They mainly framed physical activity and health as based on a discourse of choice, responsibility and individuality: That living healthily was a matter of choice, prioritizing and planning. As one mother expressed it: "*You can ALWAYS optimize*". As such, they had truly adopted the prevalent discourses of health as self-management and self-realisation. At the same time they experienced family life as interdependency, entanglement, unpredictability and need-driven. There was a marked schism between the discourses of health that they had internalized, while enacting a reality that did not fit with this logic of choice (Mol, 2008). The families recounted guilt and frustrations over not being able to be as healthy as they would like to do, to a degree where 'letting go' of the ideals and expectations became a relief:

A mom in a household where both parents had full-time jobs and with two boys aged 4 and 6 recounted the frustrations of transitioning from a physically-active single life to a busy family life with no personal time for exercise:

> Before we met, I almost exercised all the time, and felt bad if I didn't. I danced, for instance, and if I didn't go dancing I got really grumpy. And then you fall in love,

> and start slacking, because you have to prioritize each other, and now I just can't do anything, right. In the begining it was frustrating, but now it's just a kind of relief that I don't get cranky from not exercising.
>
> Mom, Family ML-G

A mom in a household with two parents with full-time jobs, and 6-year old twins, explains that:

> You could also talk about health in terms of mental health – just that it would be healthy for me to learn to relax once in a while. I mean, it's a bit contrary to what you want us to do, but I'm thinking about mental relaxation, just sitting down and let the rest fall upon me.
>
> Mom, Family BB-H

These statements challenged the agenda of the PULSE project to increase focus on physical activity. These families were already very focused on physical activity. What they did request, were means to reconciling the tensions between practices, to manage the practicalities of the everyday to just '*get a breather once in a while*', as one mother explained. Health often became a challenge and a burden, adding to the already significant load and crammed calendars of the families. They wanted to do more physical activity, or rather they felt like they *ought to want* to do more physical activity. This incessant drive to be more, do more, achieve more, was accompanied by a wish to be able to let it go, throw it away and just relax. This was for me an experience of disconcertment. I wanted to take this seriously, and actively use it to present a challenge for the project.

So this is the other story **article 1** tells: About the guilt, the inadequacy, the entanglement of health with moral values and parenting norms. The busyness of the everyday lives of families. It introduces a conceptualisation of the families that describes the household as site of these different struggles for achieving more, doing better, being better. That despite good intentions, these incessant improvement goals that seemed to ride their everyday lives, tended to turn even the most well-intended endeavour into something guilt-associated, something that was piled upon the already immense heap of to-do's and ought-to-do's. The ethnographic material I assembled provided glimpses of the many tensions and ambivalences in the everyday, the many experiences and enactments of health, and how health promotion could also inadvertently contribute to piling onto the heap. Ultimately, the fieldwork with the families from Hellerup left

me with a feeling that our health promotion efforts here had a distinct quality of preaching to the choir.

2.3.5 Summary: The 'perfect' health subjects

In this chapter I have described the fieldwork process in the Hellerup area. The material generated by the fieldwork with the families was rich and pointed to a number of challenges regarding the practical management of schedules, ambitions and ideals which led to the reformulation of the target group as not individuals, but household collectives; which are socio-material assemblages gathered by, and gathering, different practices. This is a conceptualization that can contribute to the processes and methods of health promotion by providing a starting point for sorting out the complexities of everyday life and health practices, by bundling in into components, and demonstrating that intervention needs to address all the different kinds of components; not just increasing knowledge or a sense of empowerment, but engaging with the practicalities, to situate efforts and tinkering with what might work and what might not in each concrete, socio-material setting.

The fieldwork in the area largely involved families that were habitués of Experimentarium who were involved in the PULSE project because of their familiarity with Experimentarium, and they responded swiftly and readily to the call to participate. *Despite* and *because* of their familiarity, I argue, the fieldwork caused moments of disconcertment which produced some challenges for the project. Not just concrete, practical challenges that could be overcome by means of managing tasks and activities, but fundamental challenges to the assumptions and goals of the project.

The fieldwork provided the occasion to reformulate the problem complex, in line with Zuiderent-Jerak (2015): Other questions could be posed than the ones originally intended; questions relating to the relations between us and the target group, between the health promoting project and its target group, to the definitions of its goals and values, and the reality they enacted. The way the project enacted the Hellerup families as a target group for health promotion, in need of improving their health, and in possession of certain knowledge and skills to be nurtured via participation in a health promotion project entailed a problematization of their health status. To me, the readiness with which the families responded, and their willingness to accept and work along with the project enacted a sort of conspicuous participation or participation-as-usual: They were enacting health subjectivities that were extremely attuned to the mode of participation enacted in PULSE. They were familiar with such a call to participate, and the roles and positions

offered to them by the project. In this sense, from the point of view of PULSE, they were the 'perfect' health subjects, museum audiences and research- and design participants. This seemingly perfect match between the project's intentions and the interests of the target group to me also rang some alarm bells. My initial unease rose to concern as the fieldwork progressed – or rather did not progress at all – in Husum, as I will recount in the next chapter, where I will also delve deeper into the questions of participation that rose from the fieldwork.

12 Some of the many pictures the families took depicting physical activity in different forms

2.4 'Good' and 'bad' participation?

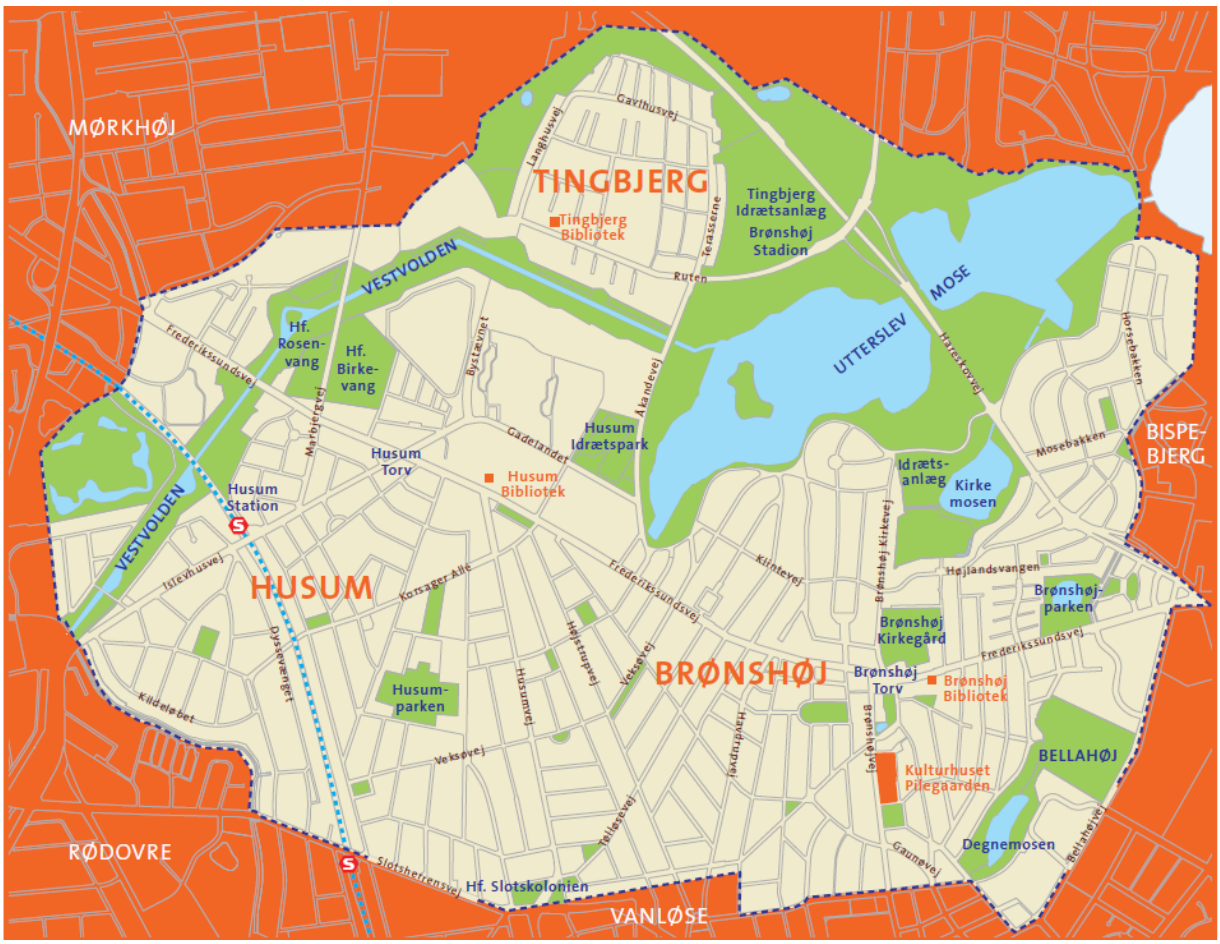
2.4.1 Conspicuous participation

In the previous chapter I described the relative ease and eagerness with which the Hellerup families participated in the PULSE development process. They represented the 'core' audiences of Experimentarium, and, as described in **article 4**, their participation challenged and shaped the design process, as intended; *through* the envisaged processes of fieldwork and codesign. The insights from their involvement were, not surprisingly, related to the everyday challenges of so to speak, *doing health right*; of how to live up to the recommendations. They clearly were familiar with the formats of participation offered by PULSE, readily embracing the notions of design workshops, group discussion and design games, using the cultural probes and answering the interview questions. Their participation was confident and competent, almost conspicuous: They declared their intentions and goals of participating as both means of demonstrating their skills and knowledge regarding health and the science centre, and to learn more about them. They accepted the precondition of them being cast as in need of health promotion, and at the same time as valuable contributors to the development of health promotion. In that sense, they embraced the position as *participatory subjects* offered them by PULSE. They were enacting health practices that were very attuned to, and compatible with, the enactment of health promotion in PULSE. Likewise, the *mode* of participation designed for them by PULSE matched them perfectly. In **articles 3** and **4** I approach the matter and manner of participation that was enacted in PULSE. In **article 3,** I analyse and discuss the challenges of facilitating participation, and the tendency to perform participation in predefined formats, employing 'formalized methods of voicing' (Michael, 2012). The formalized formats did not go well with the expectations and enactments of participation in Husum. I argue that the participatory framework provided by PULSE – shaped by the prevalent participatory paradigm within (health) education – afforded certain modes of participation, established certain relations between science centre and target groups, and performed certain positions and roles as visitor, participant and responsible, democratic citizen. This 'perfect' match between PULSE and the Hellerup families stood in stark contrast with the relations between PULSE and the underserved audience from Husum.

2.4.2 Husum: a 'problem area'

As before mentioned, the fieldworks in Husum and Hellerup were meant to progress in parallel and run prior to the development process. However, things did not progress so smoothly, as the recruitment process in Husum did not happen as easily and quickly as in Hellerup. This contrast between the families spurred my focus henceforth in the project, as I proceeded to investigate the dynamics and challenges of the participation enacted in PULSE.

The area of Husum-Brønshøj is part of Greater Copenhagen. In Husum, the area called Voldparken is an area of particular concern for the municipalities, due to an aggregation of social problems. The area is characterized by rental housing associations and was in 2010 appointed a special focal area by the municipality, launching a number of initiatives to promote health, wellbeing and improve social conditions in the area (Østergaard, Nielsen, & Borg, 2013).



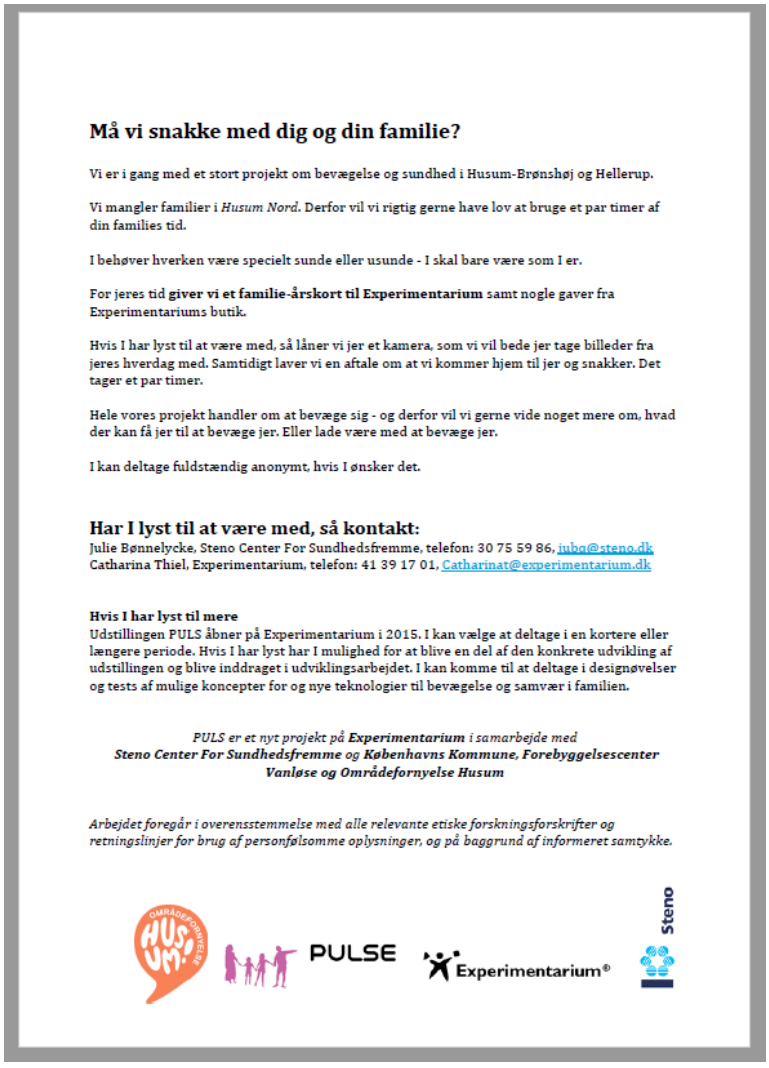
14 The Husum-Brønshøj area

13 A playground surrounded by housing blocks in Husum

When talking about 'Husum' and the 'Husum residents' in the PULSE project, it refers, in fact, to the residents of this area, rather than the larger district of Husum-Brønshøj, which in its entirety is far more varied in population and socio-economic status. The population in Voldparken is characterized by a large amount of immigrants or descendants of immigrants who are, by the municipalities, considered at risk of social marginalization and low social mobility. Recent years have seen a number of episodes of violence and crime, with several cases of shootings and homicide, threats, burglary and hash dealing. The area has also suffered from low self-reported health, with 21 % of the residents in 2010 reporting their health to be poor or less good (Forskningscenter for Forebyggelse og Sundhed, 2010). The housing associations defined the problem complex as such: A large amount of disadvantaged families, lack of tenants' participation, low sense of ownership and community, feelings of unsafety, lack of knowledge about and use of existing culture and leisure activities, and the risk that children and youths lacked development opportunities in their leisure time and would suffer under poor conditions for inclusion in general society (AAB & Fsb, 2012). Thus the problem complex in Husum was not only about health, but also a number of related issues. The housing associations in the area thus jointly formulated a masterplan for alleviating the problems of the area: Husum for All (In Danish *Husum for Alle* – abbreviated HFA) (AAB & Fsb, 2012). Subsequently, a number of

projects and initiatives were launched in the area, and the area renewal secretariat established its headquarters in the abandoned school in the middle of the area.

The municipality of Copenhagen partnered with PULSE about the efforts in Husum, and thus the Associated Activities team collaborated with the Area Renewal Secretariat, HFA, the local municipal health centre; *ForebyggelsesCenter Vanløse* (FCV), the local volunteer association, the secretariat of the local council, and the area health board. An advert to recruit participants was likewise posted in the local newspaper *Husum-Brønshøj Tidende.*



Må vi snakke med dig og din familie?

Vi er i gang med et stort projekt om bevægelse og sundhed i Husum-Brønshøj og Hellerup.

Vi mangler familier i *Husum Nord*. Derfor vil vi rigtig gerne have lov at bruge et par timer af din families tid.

I behøver hverken være specielt sunde eller usunde - I skal bare være som I er.

For jeres tid **giver vi et familie-årskort til Experimentarium** samt nogle gaver fra Experimentariums butik.

Hvis I har lyst til at være med, så låner vi jer et kamera, som vi vil bede jer tage billeder fra jeres hverdag med. Samtidigt laver vi en aftale om at vi kommer hjem til jer og snakker. Det tager et par timer.

Hele vores projekt handler om at bevæge sig - og derfor vil vi gerne vide noget mere om, hvad der kan få jer til at bevæge jer. Eller lade være med at bevæge jer.

I kan deltage fuldstændig anonymt, hvis I ønsker det.

Har I lyst til at være med, så kontakt:
Julie Bønnelycke, Steno Center For Sundhedsfremme, telefon: 30 75 59 86, jubg@steno.dk
Catharina Thiel, Experimentarium, telefon: 41 39 17 01, Catharinat@experimentarium.dk

Hvis I har lyst til mere
Udstillingen PULS åbner på Experimentarium i 2015. I kan vælge at deltage i en kortere eller længere periode. Hvis I har lyst har I mulighed for at blive en del af den konkrete udvikling af udstillingen og blive inddraget i udviklingsarbejdet. I kan komme til at deltage i designøvelser og tests af mulige koncepter for og nye teknologier til bevægelse og samvær i familien.

PULS er et nyt projekt på ***Experimentarium*** *i samarbejde med*
Steno Center For Sundhedsfremme *og* ***Københavns Kommune, Forebyggelsescenter Vanløse og Områdefornyelse Husum***

Arbejdet foregår i overensstemmelse med alle relevante etiske forskningsforskrifter og retningslinjer for brug af personfølsomme oplysninger, og på baggrund af informeret samtykke.

PULSE Experimentarium® Steno

14 The recruitment ad in Husum-Brønshøj Tidende

A few families from the villa areas in the Brønshøj area responded; predominantly ethnically Danish nuclear families with double incomes and higher education, thus neither disadvantaged,

underserved, nor from the neighbourhood we strived to involve. New strategies had to be mobilized, and the fieldwork was delayed. The timeframe and deadlines of the exhibition design process, however, could not wait for the painstakingly slow process of networking and establishing social relations with the Husum residents. Consequently the exhibition design process continued on the basis of the insights of the initial fieldwork, primarily building on the material from the Hellerup families and the very similar Brønshøj families. There were regular discussions regarding whether the ambition to involve the Husum-residents should be abandoned completely, due to the recruitment challenges, and whether, having residents from Brønshøj and other districts that were technically within the boundaries of Husum, but not the designated area of Voldparken, did or did not achieve the goal of having the underserved users represented. This raised debates about 'the right kind' of underserved users. How did we characterize them? How did we know if we had, in fact, included them or not? Were they sufficiently represented in the codesign workshops for the exhibition? This, it appeared, was not a simple question.
Technically, anyone with a 2700 postal code qualified for the project, due to our original inclusion criteria, which had, admittedly, not been very specific. However, the project description specifically said 'socio-economically less advantaged families', which the Brønshøj families, with their incomes in the range of 1 million DKK a year did not exactly qualify as. Inclusion thus became a question of technicalities. It became clear, that researchers and designers had different opinions on the matter. It also became clear, that the opposing opinions were caused by a lack of clarity regarding 1) the aim of the inclusion/participation 2) the definition of inclusion and participation, and consequently, 3) the success criteria for participation. As we discuss in **article 3**, the project contained several, coexisting rationales for participation, relating to the differences in disciplinary backgrounds of the partners, resulting in different values and conceptualisations for participation. The PAA could not make do with Hellerup and Brønshøj residents, as their goal was explicitly to get into Voldparken with activities and outreach. Therefore, the development process and the ethnographic process continuously aimed to get closer to the residents.
I started with spending time with the local area renewal secretariat and HFA, attending events such as holiday camps with activities for the area's children, HFA's popular Ramadan celebration, workshops about area renewal, and meetings and events at the local health centre, and simply making observations in the area to get an overview over the population/demography, central initiatives and challenges regarding health promotion and engagement of population

groups. I conducted interviews with professionals from the local housing association, and the local area renewal secretariat, focusing on existing and past projects for residents (both health-related, social and others), experiences with participation and central issues and challenges in the area. Besides our own challenges in achieving participation, the interviews and observations pointed towards participation as a prevalent issue. It was repeatedly articulated as a challenge by the professionals working in the area, whether within health, social initiatives or in the maintenance and development of the housing associations. As described in the action plan by the housing associations, the identified problem complex consisted amongst other things of lack of use of existing activities, the concern of lacking development opportunities for youths, increasing the risk of social isolation, again leading to the a risk of crime, unsafety and poor wellbeing. The hope was that increased participation in the activities would provide opportunities to grow community spirit, increase sense of responsibility, get residents active and healthier, and decrease crime. So unhealthy citizens, youth crime, vandalism, social isolation and garbage dumping seemed to have lack of participation as common root problem.
So, if participation was the panacea, the more important to better understand the phenomenon as it unfolded in Husum, I thought. But I was also warned by the different project staffs in the area about my venture: With the flourish of projects in the area in the later years, a number of surveys, workshops and events had taken place. Numerous projects had been recruiting (or trying to recruit) residents to projects with citizen participation and dialogue, area development, peer education, residents' networks and more. Project workers expressed a concern for exhausting the residents, and described how the latter years' many projects had seen numerous different project staffs come and go without ever having the time to establish longer-lasting connections with the residents.
After one of these meetings with the local actors, I wrote this entry in my field notes:

> There is seemingly a sense of weariness in the community from being involved in a number of projects with too little demonstrable effect for citizens. As such, there is a risk than I am perceived as yet another project-monger making the locals a study object without any ability to actually change things for the better or without genuine concern for local wellbeing and challenges.

So the impression was that we should work hard to achieve participation, but on the other hand we should not be too pushy about it, as to not make too many promises or present visions that could not be accomplished. The local actors all promised to try to facilitate contact through their network. Slowly, one by one, I got in contact with families, who often could bring me another contact; their neighbour, friend, etc. So the fieldwork stretched over a longer period of time, which, rather than serve as onset for the development, ran alongside it. The fieldwork in Husum separated into different stages, each with different foci and methods, according to the development and progression of the project, and the issues that were raised in the process. Thus I revisited the field at intervals, employing new methods and asking new questions to the participants, and to the material I gathered. As I went from the Experimentarium development process to the fieldwork, I tried to knit connections between the two settings and create resonance. Issues and insights from one setting raised questions to the other, as I conducted a dialogic exploration of the relation between the two fields.

2.4.2 Streetlights and arson: Non-doable problems

During the prolonged fieldwork, I experienced that the methods previously employed in the Hellerup fieldwork were not appropriate when working with the Husum residents. Furthermore, my sense of what was at matter had also changed, resulting in my asking different questions, employing different methods, and taking on a different role in Husum. It became a process of trying out different approaches, seeing what worked in each specific situation, as I never knew what I would encounter when visiting a family. Would they be able to speak Danish fluently enough for me to ask more than the simplest questions? Had they understood what the interview was about? Quite often, the families had been misinformed or misunderstood who I was, where I was from, and what the project was about. Often families thought I was from the health centre or the housing association, thus asking for another activity in the area, or whether I could help with this and that health issue or get in contact with a doctor/dietician for them. Thus the shape, content and themes that occurred in the interviews were very diverging. What emerged from the interviews had very little to do with the kind of health and physical activity that was enacted in the first part of my fieldwork in Hellerup. People were asking for more streetlights to feel safer when walking home on winter evenings. Retirees were complaining over youngsters' noisy behaviour. There were discords between ethnic groups, parents were lamenting other parents' lack of ability to control their children, and mothers were complaining that they could not leave

their children unattended at the playground because of fear of bullying. There were stories of mould, gunshots and of the local youth club closing because of arson.

In fact, most of the interviews in Husum did not turn out as planned. Most of them I left with a sense of concern and unease, of wondering what to make of this: Those that participated did not participate the way we would like them to do. And the issues that came to the fore were not issues that the PULSE project was likely to be able to do anything about. The project aimed to make an exhibition, an app and some local activities to increase physical activity – not replacing street lights, arranging excursions to different amusement parks or making the youngsters stop harassing passers-by. Granted, the right kind of activities might mitigate some of this, if able to provide an appealing alternative and spurring positive social interaction. But this would be collateral outcomes and not part of the goals of PULSE. So the participation of the residents could point to problems and desired outcomes of an initiative, but not to possible solutions. Instead, their contributions pointed in all kinds of directions. Rather than providing any answers, the fieldwork more than anything questioned our agenda, raising the touchy question, "*What are we busy doing*?" (Michael, 2012). The insights were not exactly what the project needed– but those were the problems that were at the fore for the residents. The problems that were at stake in Husum were not really *doable* in light of the *projectness* of PULSE (Langstrup, 2011; Lassen et al, 2015).

In **article 2**, I recount an episode in a Husum family, where the interviewer desperately tries to keep a family gathered and composed long enough to perform a coherent interview about a design mock-up. But chaos reigns, and the family members keep running in different directions. They are, in fact, participating; they are willing to contribute, but not able to do so in the manner that is required for the interview to 'succeed'. Almost every interview my colleagues and I conducted in Husum, no matter how I tried to adjust for methods, positions, roles, levels of information, etc., played out in a manner that was somehow unmanageable for me – and the project. The fieldwork in Husum seemed one prolonged moment of disconcertment.

2.4.4 Who is the expert?

There were also mismatches in expectations regarding the roles of expertise and authority in the participatory process. In **Article 3** we recount the confusions that arose because of divergent expectations to which kinds of expertise the different participants could and should provide. The same confusion was expressed in the Husum interviews, where clearly, the residents did not

conceive of themselves as responsible for driving change – they presented requests for new facilities, asked for help and guidance. Many of them did not conceive of themselves as resourceful or creative enough to initiate this. Clearly, health knowledge was something 'professionals' possessed and should disseminate to target groups when needed. Furthermore, health was something that should be promoted through help and care. As a result, I felt unable to provide the help the families were asking for, and my posing questions regarding how they could change their lives, felt quite misplaced. The reallocation of responsibility, competence and empowerment in the target groups that the participatory paradigm conditions, seemed to meet resistance in Husum. Also the appropriateness of the science centre setting as health promoting agent was questioned, as the science centre was more often seen as a site for entertaining family visits in line with amusement parks, as they mentioned Experimentarium, Tivoli and the Zoo interchangeably. In the codesign process, some clearly expressed the inappropriateness of being confronted with the issue of health in a leisure setting, where the family would primarily come for recreational purposes.

2.4.5 Summary: Enacting participatory subjects, doable problems, and good or bad participation

In this chapter I have recounted the challenges and paradoxes produced by the kind of participation that was enacted in the PULSE project. The challenges of recruiting participants from Husum and operationalizing the knowledge that was produced through the fieldwork indicated that the goals and methods of PULSE based on the participatory paradigm inadvertently produced more and less desirable ways of being a participant, and more and less useful input. This paradox was emphasized by the contrast to the Hellerup participants, who enacted conspicuous and routinized participation, which was extremely attuned to the envisaged mode of participation and kinds of input expected by the PULSE project. I have recounted how the problems uncovered by the fieldwork and participatory process in Husum were not addressable by the project setup and the goals of the project. Instead of accommodating the different problems in the different areas, the project 'had to' follow the designated course of producing specific products that did not match the practices of health and family life of the underserved users, and indeed had problems recognizing the kinds of input and modes of participation they were able to perform. Consequently, the project produced 'right' and 'wrong' kinds of participation, and 'good' and 'bad' participations; i.e. participants who were able to

behave in a certain manner, had certain competences and ways of articulating their challenges and solutions, alongside doable health problems (Lassen et al, 2010); i.e. problems that were addressable by the project.

15 Participation at Xbus, Experimentarium

2.5 Codesigning health promotion

2.5.1 The PULSE development process

In this chapter I turn to the material and analyses based on the development process at Experimentarium. The development process took place simultaneously with my activities in Husum, and consequently, the two processes and my analytical foci and methods are interwoven. As such, events in one strand spilled over into the other, clashed and entangled. For the first part of the development process, the project group was placed together, in common offices; researchers and developers alike. For months during 2012-13, I followed the PULSE development process at Experimentarium, participating in workshops, seminars and project meetings, as well as informal talks at lunch and across desks. This I supplemented with interviews with project managers about the project's goals, methods, progression and challenges, repeating the interviews at different stages of the process, to reflect on current developments and results. Every day in this stage of the project was thus considered fieldwork, and the empirical material from this part of the project is consequently vast and heterogeneous: Notes, minutes, process documents, sketches and post-its, prototypes and mock-ups, posters and calendars, children's drawings, photos and videos. In other words, reflecting the socio-material complexity of the development process in all its glory (see also **appendix 2**).

2.5.2 THAT workshop! Annoying ethnographic stories

After the first stage of fieldwork in Hellerup and Brønshøj, CTS and I went through the empirical material together, comparing notes, looking at photos, listening to recordings, going through calendars, drawings and more. We discussed how best to pass on this ethnographic richness to our project colleagues at Experimentarium in the forthcoming workshop where we were to recount the insights of our fieldwork to the designers, so as to facilitate the generation of design ideas. We knew that the designers were intent on focusing on physical activity, and on getting the pulse up. We also knew, based on the project description and goals, that the concepts were to be based on a positive, fun experience, and on the involvement of the whole family. There was a lot of excitement about the project at Experimentarium: Not only was it an entirely new topic; the approach, the collaboration and the user involvement were all new and exciting. One narrative about the project was particularly strong: The Executive Director had once seen an exhibition about smoking and its adverse effects, which motivated him to cease smoking

immediately. He had not touched a cigarette since that day. That anecdote had become the epitome of the Experimentarium aspiration to enable transforming experiences, and was quoted frequently by Experimentarium staff and managers when referring to the goals of PULSE: To plant a seed, provide that one, ground-breaking experience that might have the power to transform people's lives.

We wanted to engage with that notion of being able to provide the experience that would transform; show the extent of the complexity and the heterogeneity of the health practices: That changing complex, everyday lives might be about more than information and motivation. There was an expectation that we would present some neat and clear-cut results that pinpointed to the potential for the creation of such an experience. As one project manager expressed; they expected researchers who would say "*THIS is what our users want, let's go ALL IN on that!*" (See **Article 3**). Instead, we presented an assemblage of logics, values, emotions, doings and sayings, obduracy and flexibility. We used the ethnography to depict the co-existence of opposing logics, and that the families' health practices were built upon not only choices and motivations, but also structures, practicalities, negotiations and compromises. In other words, that health and exercise are rarely just matters of choice, motivation and individual action (It was, in fact, an early version of **Article 1**). When we were done presenting our material, there was a moment of silence, before a heated discussion emerged amongst the entire PULSE project group. Some were troubled, curious, and inquisitive. Some were provoked. What was the meaning of this? What was the use of these stories? What should the designers do with this? The workshop was often since referred to as THAT workshop by the project partners, in a certain tone, and with a telling look. Clearly, our ethnographic stories were disruptive for the designers and their envisioned design process. We had used our ethnographic material deliberately activist: Trying to talk to, and against, the ideas and images of the users and what Experimentarium could offer that were already flourishing in the project. It was a significant moment of disconcertment that raised questions about the basic assumptions of PULSE. It made me wonder what kind of epistemic disaggregations might be at stake beyond the immediate challenges of making researchers and designers collaborate on a co-design project.

A number of ethnologists have experienced and described similar situations where creative design and innovation processes were 'obstructed' by the ethnographic descriptions of the everyday (Damsholt & Jespersen, 2014; Elgaard Jensen, 2012; Löfgren, 2014). An ethnological approach to everyday life tends to entail an emphasis on the complexity of the everyday, of the

routines and structures that are repeated, along with the order-and-chaos and the logics-in-mess. Based on the experiences of Danish ethnologists Astrid Jespersen and Tine Damsholt with challenging innovation projects, Swedish ethnologist Orvar Löfgren, describes how, for consultants, and innovators everyday life does not go well with the buzzwords of 'creativity' and 'innovation', rather it is a 'box and a burden'(Damsholt and Jespersen 2014, Löfgren, 2014). Why is that so? The challenges in handling the ambiguity and complexity of everyday lives and actors in the codesign process could be caused by a codesign-setup that disrupted social dynamics and distanced itself from the everyday complexities. In its creative and play-like setup, with staged family visit and games of choosing, prioritizing and building, the codesign setup produced scenarios that in a laboratory-like manner distilled and purified situations of choice and logic-based action, which are in practice situated, complex and contingent on multiple, tacit, emotional, irrational and subtle processes. By exposing the frustrations amongst designers looking for ways to translate ethnological fieldwork into design ideas, and frustrations of participants in translating design exercises into real life action and behaviour change, the process exposed significant gaps between everyday life and the creative engine room of (museum) design practice. The designers needed simple, designable issues. They needed knowledge and statements that could be solidified and materialized in exhibition design. That were unambiguous and durable. That would be useful knowledge, rather than the complex and vague ethnographic material, which, as one designer put it, when responding to our presentation, 'anyone could have gone out and asked their neighbour about'.

2.5.3 Rationales, expertise and valuable input

After THAT workshop, series of codesign workshops were held with the PULSE families (see **chapter 2.2** and **appendix 2**). The 10 families participating in the workshop series were predominantly families from Hellerup or the more affluent parts of Husum-Brønshøj. Not one family from the Voldparken-area participated in the development of the exhibition, as they had not yet been recruited when the workshops were held. In **Article 3**, we describe how the codesign setup challenged existing power structures and expertise, and revealed differences in rationales for involving the users, thus creating a distributed landscape of expertise. We describe how different expectations, rationales and values for user involvement and design result in different valorisations of complexity vs. clear-cut statements and user ideal types. In PULSE the negotiations between different disciplines and different knowledge practices led to the

enablement of certain kinds of input and a distribution of certain roles and kinds of expertise. Participants were granted certain positions and the authority to provide certain kinds of input to the design process. The expectations of codesign to give equal status and influence to all participants unfolded in practice as a choreography of constantly shifting positions of influence, infused with ambivalence and insecurity about which kinds of contributions the parties could and should make. It shows how expertise and decision-making power were granted to parties in some positions, while they were stripped of it in others. The article recounts how the collaboration constellation had prescriptions and pre-existing rationales for how and why participants should participate and contribute and the project struggled when these expectations were challenged. By critically scrutinizing how the presumed users are enabled to participate in the codesign process, the article points to how the codesign process constitutes the participants in certain ways, in some cases reinforcing marginalization or presuming certain skills and interests in participating, thus formatting a certain kind of participating subjects. Thus the hope that codesign will enable the formation of participating, empowered and competent subjects and museum-users, in fact pre-supposes users that have these skills and can fit into the pre-existing schemes and scripts of a participatory design process.

The codesign has in its basic assumption about democracy, sustainability and impact (better product), similarities with the assumptions and rationales from Action Research and health pedagogy regarding the involvement of target groups. In fact, in PULSE codesign was chosen as participatory approach because of its similarities to the values in the PULSE project description, which was informed by Action Research and health pedagogy. However, in PULSE it became clear that, due to the institutional and disciplinary framework of the project, the co-process did not open up for just anything: Some problems and some kind of knowledge were discarded as they were not ‘usable knowledge’ and ‘doable problems’ (Lassen et al, 2010). The co-design process is thus, I argue, also a process of imposing a certain kind of order, of making certain things knowable, while excluding others.

2.5.4 Associated Activities

Besides the exhibition branch, the PULSE project had the outreach design branch, called Associated Activities (henceforth PAA). The PAA aimed at designing 1) a smartphone app to link to the exhibition and increase physical activity in the everyday setting, and b) locally

situated activities to bring PULSE out to the target groups. Like the exhibition development process, this was to be based on the participation of the target groups. As the designs were to function specifically in the local settings, it was particularly pertinent to have participants from both areas involved in the process.

2.5.5 The Pocket Dog

As with the exhibition development process, the PAA development process encountered no obstacles in recruiting participants from Hellerup. The PAA team strived to find Husum-residents that would participate in development workshops, but did not succeed within the time frame where the workshops were to take place according to the project plan. Instead, a fieldshop was held with Experimentarium designers, external partners and researchers, based on the existing fieldwork material on Husum-Brønshøj. The family chose the Pocket Dog – a mobile application introducing a dog that could be taken on walks to earn points and compete with others on distance and frequency of walks. The designers dedicated the following process to refine and develop the idea of The Pocket Dog.

16 The Pocket Dog: Families choose their digital pet and can earn points by taking walks, logging miles on their phone and 'marking their territory' by placing digital pee and poop. Peeing on 'the golden lamppost' placed at Experimentarium and at the community run earns an extra bonus.

By the time the app concept was developed, the process of recruiting Husum-residents had progressed to find a gatekeeper; a local resident who was able to provide contact with families willing to participate in the test of the analogue model of the app. The test was conducted with two families in Hellerup (both Danish), and four families in Husum; two with Danish families, one of Pakistani origin and one of Syrian origin (see the PAA concept report (Poulsen, Siquir & Nørgaard (2013)). As described in **ARTICLE 2**, the test process disclosed significant differences between the Husum-residents and the residents of nearby Brønshøj areas in terms of managing the test tasks and providing the kinds of input envisaged by the design team. Their feedback fed into the design process, but also to me emphasized the need to reconsider formats and values of participation when working with underserved users.

2.5.6 The 2700 run and the Agility Course

The next stage of the PAA process was to develop outreach activities in Husum. Even though the fieldwork had progressed to include a number of Voldparken families, the team decided not to involve families in a workshop, but opted instead to invite local stakeholders and key actors that were able to draw on their professional and personal experiences with working in the area with the residents. The aim was to develop design principles and draw on best practice by exchanging experiences, mapping resources and existing projects and possibilities to build on. Based on the insights from the fieldwork, the approach was to address some of the challenges and requests of the residents: To create positive, communal experiences that could hopefully support local sense of community and nurture local resources. The participants conducted a mapping exercise, mapping existing activities, social hotspots and potential locations for the local activities. Subsequently they did a design game on building the event/activity in Husum, with the aid of modelling clay, matches, pipe cleaners and post-its, and building on personas, quotes and vignettes from the fieldwork. The groups would then present their concepts. The majority of the groups opted to build on the existing 2700 run, an annual community run arranged jointly by the HFA and FCV. Afterwards, the PAA team, HFA and FCV continued the collaboration on developing the 2700 run. The HFA increased advertising for the run, and the PAA team designed an agility course for families inspired by the Pocket Dog: A movable set of dog-themed obstacles for balancing, jumping and climbing, which doubled as Pocket Dog branding and exercise opportunity. Before the 2700 run it was placed in the hall of the local school as advertising stunt for the 2700 run and exercise opportunity for the children during recess. The PAA team

distributed flyers for the 2700 run and the Pocket Dog, and the local 7th graders were appointed ambassadors for the 2700 run.

17 One of the concepts from the PAA workshop: A PULSE-revamped community run

8 The Agility Course at Husum School

5 days later, on a Saturday morning in June, the 2700 run was held. Project workers from the housing association, the area renewal, the volunteer center and the municipal health centre set up party tents with tables with flyers, competitions and other health- related activities to draw in the local residents. With refreshments and medals to all participants, lottery prices, warm up and local youths performing rap and dance they had rehearsed at the activity cetnre, the run was meant to be a community event. The Agility Course was set up roughly half-way along the distance, so people could add a few jumps and balances to their run.
The organizers of the 2700 run had hoped to beat previous attendance significantly, due to the increased advertisement and new additions to the run. However, counts revealed only about 75 participants, even less than the previous year's 100 + participants, and far less than hoped for. The participants in the race were largely ethnic Danes, with a few exceptions. One of the few families of non-Danish background was a family I had previously interviewed. In other words, those that participated were, so to speak, the usual attendants to similar activities in the neighbourhood.

9The 2700 Run

2.5.7 Xbus

In order to bring the Husum residents to Experimentarium and in the hope of establishing some relations that would enable more participation and provide research opportunities, the idea of the Xbus was conceived (named after Experimentarium's nickname amongst employees; X). The Xbus was a free evening at Experimentarium for Husum residents, who were bussed to the science centre from Husum, and were offered a meal and a couple of hours in the exhibitions after regular closing time. During the evenings, explainers performed scientific demonstrations, dissections and hands-on activities. The event was advertised and arranged in collaboration with HFA, who organized registration and accompanied the residents. During the evenings, researchers took photographs, performed observations, and offering participants the opportunity to be interviewed, if they were willing. Notably, the Xbus event did not mention health or pose any requirements of the residents, other than showing up at the bus. The event was by the residents not perceived as any different from the other excursions the HFA arranged at regular intervals for the area inhabitants, as evident from my later interviews with some of the participating families. In other words, the event did not require participants to take on another role or identity; it did not attempt to involve them in a health-promoting agenda or ask their expertise. As I describe in **article 2**, the Xbus afforded modes of participation that were relatively unscripted and open-ended, and thus provided more inclusive experiences for the underserved groups. Since the Xbus was not part of the original project description, but rather an additional outcome, it was unstructured and open-ended, having but the success criterion of generating attendance.

10 An Experimentarium explainer performs a dissection at Xbus

2.5.8 Summary: Enacting participatory subjects and doable problems

In this section I have described the PULSE codesign process and argued that, rather than increasing democratic co-decision making, the co-process did not open up for just anything, but constituted the participants in certain ways. It distributed expertise and authority in certain ways, enabling the participants to come with certain kinds of input in certain spaces. Some problems and some kinds of knowledge were not 'usable knowledge' and 'doable problems'. The codesign process provided a configuration of participation which went well with the museum-familiar audiences, but which did not enable the participation of the underserved users. In that sense, the co-design process, by presuming certain skills and interests in participating, formatted a certain kind of participating subject, in some cases reinforcing marginalization and exclusion. By demanding that participants make choices, prioritize and argue in a creative workshop-format, the codesign process tended to enact a logic of choice rather than a situated kind of engagement with everyday health issues. In the next section I will delve more into the topic of health promoting exhibitions enacting onto-norms based on a logic of choice and motivating information.

2.6 Health promoting exhibitions: ontonorms, authority and socio-scientific issues

In this section I will turn to the PULSE exhibition and the health promotion it enacts, and relate the experiences of PULSE to the burgeoning genre of health promoting museums. I will do so because my investigation of PULSE and its relatives awoke similar experiences of disconcertment, which pointed me in the direction of yet another dilemma and thus analytical theme: The theme of ontonorms and authority enacted by health promoting museums.

2.6.1 The ambiguous notion of health

Throughout the development process in PULSE one discussion repeatedly emerged: How do we present health in a manner that is positive and does not frighten off audiences? From early on in the process, the analyses of the fieldwork I conducted in collaboration with CTS demonstrated the contentious and ambivalent nature of the topic of health. Our studies showed that families tended to associate health and physical activity with guilt, with something uncomfortable and troublesome, but at the same time felt that it was something they ought to enjoy. As I described in chapter 2.3, the families never felt that they achieved 'the right level' of physical activity; they seemed to be living an incessant struggle to do more and better. To me, this caused some disconcertment: Then should we really provide them with more images and ideals about how to live healthily and more actively? On the other end, we had underserved groups who perceived health as a different kind of matter; not to do with play and 'optimization', but as matter that required help and care. They asked for help, not motivation or education, but in manners the project could not offer. It thus seemed that the health promotion efforts of PULSE either hit the mark too well, prodding on an already very sore sport, or missed their mark completely.
One particular incident emphasized the ambivalence I felt, and caused general disconcertment in the project: A design workshop, where a mother heatedly exclaimed that she did not think that Experimentarium should interfere in her everyday life and tasks. She also commented, when presented with an exhibition idea, that this confrontation with her health status and lifestyle was not what she expected to see when coming to the science center. Within the project group, there were continuous discussions regarding how to work with this: Health was clearly a matter to approach with caution; sensitive and fraught. How could exhibition design accommodate these

tensions? The insights from the user involvement and the design workshops showed that the audience preferred not having a focus on calorie counts or 'scare campaigns', but rather on an enjoyable experience. The development team struggled with navigating between working with a broad and positive notion of health that encompassed target group articulations of good every day and family life, and with formulating an approach to health – and, more specifically, the prevention of a sedentary lifestyle – which was concrete and delimited enough to be manifested in clear and unambiguous exhibition design. Despite the credo of a broad notion of health, PULSE did, in fact, focus solely on physical activity. As I have pointed to in the previous chapters, other health-related issues or issues pertaining to quality of life in a broader sense, could not be accommodated by PULSE. This dilemma of working with the broad and positive notion of health has been conceptualized by ethnologist and humanistic health researcher Lene Otto, who has described the challenges within health research of delimiting and defining a notion of health which is not based on biomedical content: Health tends to be defined either in biomedical terms, or becomes a notion so fluffy and ever-expanding as to practically loose meaning (Otto, 1998). As a result, it is in practice very difficult to provide clear and unambiguous education about health without defining a quite specific notion of health. The PULSE team experienced this struggle in practice.

2.6.2 Onto-norms in health promoting exhibitions: the good, the healthy and the really funny

Struggling with the sense of disconcertment from the dilemmas of the PULSE development process, I wanted to investigate how other health promoting exhibitions addressed the issue. At Experimentarium, staffs regularly take study trips to the US/Canada science centre and science museum scene. In the development process they often referred to American exhibitions and projects. So in April-May 2015 (At the same time as the PULSE exhibition opened to the public) I went to the US to seek out the projects and exhibitions I had heard and read about (see also Maher, 2010). I wanted to explore how health was conceptualized and communicated in other museums, and to investigate whether the experiences and challenges of PULSE resonated with those of similar institutions and projects. Knowing that the structural and historical context of American cultural institutions is vastly different from the Danish, and likewise the social and health issues in the American health system, the intention was to learn from the differences as

well as the similarities. I visited 5 exhibitions, and analyse three of these in **Article 4** (see also **section 2.2** and **appendix 2**).

In **Article 3** I drew on the notion of affordance to suggest that the participatory and learning events and environment designed in PULSE afforded specific modes of participations and relations. This means that audiences are enabled to engage with the exhibitions, exhibits, and indeed the entire museum space, in certain ways. The museums prescribe certain kinds of action, modes of learning, and indeed states of mind. Despite inclusive and participatory efforts museums produce preferred kinds of visiting and visitors. In my analysis of the health promoting exhibitions in **Article 4** I describe, drawing on Dutch philosopher Annemarie Mol (2008, 2012) how different approaches to communicating about health produce certain ontological norms. These onto-norms I consider normative prescriptions; the collateral enactments of states of mind, bodies and health that are implicated in the production of health promoting exhibitions. In other words, the exhibitions carry certain assumptions about how the target groups live, should live, and want to live. I employ Mol's description of the two opposing logics within health care; *the logic of choice* and *the logic of care* (Mol, 2008) to analyse how the exhibitions allocate responsibility for health and engage with the target groups, arguing that the exhibitions tended to enact health based on a logic of choice, with the implicit assumption that by providing information and education about the factors affecting health, the target groups will become motivated and knowledgeable about their health condition, and consequently take action. A common denominator of the exhibitions I visited was the tendency to veer towards certain definitions of health; namely diet, exercise and hygiene. They explained the bodily functions, the effect of exercise and foodstuffs on the body, and encouraged lifestyle change through hands-on approaches that aim to make small everyday changes to increase your health and wellbeing. They all had a very clear aim: How to achieve better health, in terms of increasing physical activity, limiting the intake of unhealthy foodstuffs, decreasing risk behaviour and raising awareness of the importance of hygiene, adhering to the advice of health professionals and so on. By their explicit addressing of the visitors, and formulations of health as 'power', 'success', alongside catchphrases such as "*Your health is up to YOU*", they enacted the logic of choice as an ontological norm; a norm where health is a matter of choice and personal action. They presented clearly defined notions of health and advice on 'how to do'. Their learning goals were thus not open-ended, but quite narrow and specific. This makes me suggest that they enact a

rather positivist learning approach, where audiences are to be recipients of health messages, rather than being invited to engage in a discussion on definitions and values of health.
They furthermore had as common denominator of presenting health as a form of self-realisation, equating the achievement of better health with achieving your social and personal aspirations. Others have pointed to the problematic linkage between health and self-actualization, and how the endeavour to constantly improve your health becomes a moral imperative (Dragsted et al, 2011; Otto, 1998, 2008; Rose, 2007; Vallgårda, 2005). The exhibitions want you to optimize your life, by becoming more playfully healthy. The exhibitions thus do not contend with motivating their visitors to live more healthily – they also want them to enjoy it.
As I posit in my analysis in A**rticle 4,** in the health promoting exhibitions I studied, the museums acted as authorities who want to tell people what are right and wrong kinds of health behaviour. By this approach the museums are positioning themselves in a relation with their visitors that is more authoritative and prescriptive than dialogic and forum-like. They assume the visitors to have a latent desire to live healthily and that by providing motivation and information, target groups will be enabled to realize these aspirations. This enacts the same knowledge deficit assumption the first generation of science centres was based upon: That the public was not knowledgeable enough about science, and that by providing information the public would take a more positive view on science. Hereby the science centre education approximates the original positivist communication approach rather than the latter years' ambitions to make audiences co-creators of knowledge and competent discussants of socio-scientific issues.

2.6.3 The PULSE Plaza Exhibition

After my study of the health promoting exhibitions in the US, I tried to view the now opened PULSE Plaza exhibition in the light of my experiences and analysis of the similar, yet quite differently framed exhibitions; by studying the exhibition for onto-norms in its enactment of health as an issue and how the visitors are addressed and engaged.
The PULSE Plaza Exhibition focuses on physical activity, as also indicated by the name. The exhibition aims to get bodies moving in ways that are fun, down-to-earth and mimic everyday life. The exhibition consists of eight exhibits and a center-point, the MidPoint, where visitors begin the visit by forming a group and creating a login. Each of the exhibits features an activity that twists an everyday scene into a stage for physical activity. In the Rodeo Lounge, an armchair

is transformed into a rodeo-bull where one team member is seated while the others try to make her tumble off by pulling ropes to make the rodeo-bull buck.

11 The Rodeo Lounge, the Energy Roller and the Balance Kitchen

At the Dance Bathroom, the bathroom is turned into a disco dance-floor, and at the Balance Kitchen, a topsy-turvy kitchen the groups can play the floor is lava by balancing and climbing around and hitting lighting buttons on time. The Bike Shed provides exercise bikes with screens to resemble a bike ride, and at The Fence Jump, the visitors can try to jump as high as possible and learn how to jump even higher. The Energy Roller lets visitors try to 'earn' foodstuffs by walking the kilojoule they contain. In the Obstacle Hallway the teams are to compete on

climbing through a cluttered hallway to reach the other end first. The Ball Cage turns spectators into active players by providing a competition on throwing balls into holes in the spectator seats instead of sitting on them.

12 The Obstacle Hallway and The Ball Cage

The exhibition delivers very little factual information about health or physical activity; rather, the purpose is to create bodily experiences of physical activity. For instance, at The Fence Jump, the visitors can try to jump as high as possible, then watch a video of their jump, and receive feedback on how to improve their technique to jump higher – by flexing more at the launch and using the arms to boost the jump. As such, the exhibition aims at giving the visitors a success experience; that they can quite easily become better by getting a feel for the use of the body. At the bike shed, the groups are to bike hard, feel their pulse rise, and then pause, to feel it come down again. By directing the attention towards the experience of physical activity, the aim is to create bodily awareness and appreciation, and enact an everyday, non-medical version of health. This makes the exhibition less imperative, and it addresses the visitors less directly than widespread health advice approaches. At the basic level of access, it presents itself more as fun

games for groups of visitors. Only in the MidPoint and at very brief exhibit instructions is any factual information found, for instance:

> The Dance Bathroom
>
> *Are you Denmark's next big dance talents? It's bath time fun when you dance in time to the director's movements.*
>
> Dancing is good exercise. When you dance, you use different muscles than you would jogging, for example, and you also train your coordination and balance. When you dance, the brain releases hormones called adrenaline and endorphins. It gives you a feeling of lightness and happiness – so you can dance yourselves happy!

PULSE Plaza Exhibition text

13 The Dance Bathroom

At the MidPoint the visitors can also see pictures of themselves performing the activities, get fun-facts about the activities and take quizzes, for instance:

> **How much can music improve the exercise, if you for instance run with headphones on?**
>
> 1. It's nice, but music can't improve the exercise
> 2. It can take up to 20 % longer before you have to stop (correct)
> 3. You can run almost twice as fast
>
> Research tells that music affects you and makes exercise feel easier. If the rhythm of the music fits your exercise rhythm, the feeling of strain is delayed. More specifically, if you work out moderately (short of breath but not strained), you can exercise 20% longer before exhaustion stops you. You can put that into use if you take a run or clean full throttle.

PULSE Plaza exhibition text (my translation)

The setup of a series of home-like environments is meant to inspire to do more impromptu physical activity at home. The exhibition aims to inspire the visitors to see their home environment imaginatively; as spaces that may transform into sites for physical activity. But it does so in a dialogic way, by encouraging reflection and discussion:

> (…) The most common explanation [for not being physically active] is that children would rather spend time with their friends. 4 out of 10 children say so. Some children want to go to sports, but miss someone to go with – and then there are children who don't like sports at all. Can you think of good ways to be with your friends and be physically active/exercise at the same time?

> (…) Most adults explain that work is the reason they don't get so much exercise. A lot of them also say that they spend their time with their family instead. Can you think of good ways to get moving and be with your family at the same time?
>
> (…) Most children are physically active, because they think it is fun. Amongst adults there is more talk about 'getting in shape' as the reason to do sports. What do you think they mean by that?

(PULSE Plaza Exhibition texts)

In this exhibition text, PULSE attempts to engage with the challenges of physical activity that the visitors experience in their everyday life. It attempts to take into consideration that there are challenges to the way people live that get in the way for intentions to live healthily, and seeks to engage visitors in a dialogue about how to mitigate the challenges. Thus, PULSE encourages reflection and finding your own solutions, while trying to avoid imposing guilt. Here the exhibition is based on the *logic of care*, by seeking to engage with the everyday practicalities of family life, and by providing small tweaks that slowly increase physical activity.

2.6.4 Authority or partner in dialogue?

I have suggested that the health promoting exhibitions produce collateral realities and ontological norms with adverse effects. The exhibitions I analysed in **article 4** were, despite intentions of the opposite, normative and authoritative. They articulated specific learning goals based on health recommendations, and enacted primarily *the logic of choice*, where the learning experiences provided by the museums aimed at producing health-conscious subjects who employ the health knowledge provided by the exhibitions to take responsibility and change their lives. The exhibitions present health in a playful and positive manner, however the key note is authoritative: The museums mainly provide advice and guidance regarding how to live up to recommendations.

In opposition PULSE provides a somewhat more open-ended learning process with its open questions and the partial absence of messages and instructions. There are, however, still certain

conclusions that the exhibition aims the users to reach. It wants people to want to do more physical activity. There are no overt normative messages or admonitions, yet it is infused with norms about physical activity. The exhibition goes by the motto: "*Have fun living healthily*". The exhibition thus encourages visitors to see the potential for fun in physical activity. This approach is related to Mol's notion of learning to take pleasure, of nurturing the body into something that might be able to enjoy what is good for you (Mol, 2012). The exhibition enacts bodies and everyday environments that can be cultivated to enable positive and achievable experiences of physical activity, that are not related to threats, disease or narrow definitions of healthy or unhealthy behaviour. There are no problematizations of the lifestyle or habits that you, as a visitor, might have, and the exhibition seeks to avoid inducing guilt or invoking negative associations. Rather than connecting physical activity with health, the exhibition enacts physical activity as primarily associated with play and fun. In sum, the exhibition enacts less logic of choice, and less of a dichotomy between mind and matter, by suggesting that mind and matter can, so to speak, collaborate to cultivate enjoyment and have fun while doing something healthy. This approach resonates with current health discourses that aim to connect healthy behaviour with self-actualization, equating the good life with an active, healthy life, and living healthily as being all you can be. The approach presents health and physical activity as the means to a good life. On the downside is that the exhibition thus enacts the implicit imperative of enjoying health, and assuming that we all can and will enjoy health, if only we perform it in the right and playful manner.

14 The PULSE universe signifies family fun and quirky, empowering activities

2.6.5 Summary: The health promoting museum: enacting health as matter of concern

The health promoting approaches I encountered and analysed in **article 4** tended to build on a knowledge-deficit approach. They generally conceptualized *the right knowledge* and *personal motivation* as main drivers for change. They aimed to infuse fun and pleasure into healthy behaviour, and sought to produce fun experiences that are compatible with healthy behaviour. However, they all allocated responsibility in a certain manner, and by articulating their target groups in a certain way produced specific subjectivities and relations. They tended to vacillate between positive notions of health and risk communication and, while demonstrating the structural preconditions for health, tended to enact health as an issue of mind over matter, based

on the logic of choice. Their approach enacted certain subjectivities; subjectivities that not only have the right kinds of healthy behaviour, but also strive to enjoy it. By insisting on emphasizing health as the potential for fun, for feeling strong, good and successful, the health promoting exhibitions risk neglecting the struggles, the hardship, and most of all, the practical challenges of incorporating more physical activity and dietary changes in everyday lives that are often full of stress and strain, and where the gap from knowledge to action can be quite significant, as I argue in **Article 1**. As our fieldwork showed, health and physical activity were far from matters of individual choice, but collective matters, entangled and in opposition with different practices, values and practical necessities. Thus there is a significant gap between health presented as a matter of learning facts and implementing them in the everyday by making different choices. Our study showed that physical activity could be in conflict with family values and experiences of good everyday life. By defining 'the good life' as an active life, physical activity as success, and an active body as a powerful body, the opposite is implied: That an inactive body is powerless, that a sedentary life is unsuccessful, and that you if you are unhealthy, you are unhappy.
Relating to the professed aim to facilitate dialogue, the kind of dialogue that the health promoting museums tended to engage their visitors in, were *how* the predefined health targets can be achieved, not *questioning* the basic assumption that health promotion and behavioural change are needed, or *engaging* with the health dilemmas people encounter in the everyday.
As I contend in **article 4**, health promotion ultimately seeks to intervene in everyday lives, by providing education and intervention to change behaviours. Thus the orientation towards health promotion entails a normative and imperative way of addressing the target groups, carried by an interventionist agenda. In the health promoting exhibitions, the museums position themselves not as partners in dialogue, or neutral grounds for discussions to take place, but as the knowledgeable and authoritative actors that initiate and shape certain kinds of learning. By taking on health promotion, museums take a normative stance, and venture telling people what to do and what not to do. Health promoting exhibitions are not value-neutral: They produce right and wrong kinds of behaviour, bodies, and subjects. They define good lives. And their enactments of these versions of health and good lives are based on specific choices: Design choices, didactical choices, ideological choices, pragmatic choices. They are based on the political, disciplinary and financial history of museums. These trajectories shape how health is enacted as a matter of concern.

2.7 Articles

27 Explainer performing demonstration for Husum residents at the Xbus event, Experimentarium

Article 1: Household Collectives: Resituating health promotion and physical activity

Accepted for Sociology of Health & Illness

Julie BØNNELYCKE[a*], Catharina Thiel SANDHOLDT[b] and Astrid Pernille JESPERSEN[c]

[a]Steno Diabetes Center Copenhagen, Niels Steensens vej 6, building NSK, 1.11, DK-2820 Gentofte and
Copenhagen Center for Health Research in the Humanities, Saxo Institute, University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark
E-mail: frx538@alumni.ku.dk
[*]Corresponding author.

[b]Experimentarium, Tuborg Havnevej 7, DK-2700 Hellerup and University of Copenhagen, Øster Voldgade 3, DK-1350, Copenhagen K and Department of Science Education, University of Copenhagen, Øster Voldgade 3, 1350 Copenhagen K, Denmark

[c] Copenhagen Center for Health Research in the Humanities, Saxo Institute , University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark

Key words: Collective, ethnography, family, health promotion, household, practice theory

Household Collectives: Resituating health promotion and physical activity

Abstract (196 words)

In this article, we situate the practices of health and physical activity in *household collectives,* and conceptualise everyday health 'behaviour' and lifestyle as complex, collective practices. Based on an ethnographic study on everyday family life and health practices, we provide a framework for understanding the household as a collective, where the household collective may take precedence over individual preferences, and individual behavior has collective implications. We describe the household as a node for practices, gathered by the activities that draw together and align actors in collective practices of everyday life. In the everyday efforts of the households to live up to ideals and balance conflicting practices, healthy living is about more than simple, individual choices about whether to follow health recommendations or not. It is also dependent on pragmatic negotiations, the distribution of roles and tasks, and conflicts between ideals and what is feasible in the everyday management and maintaining of the household. We suggest that engaging with these collectives could serve as a useful point of departure for health promotion activities, situating health promotion in the here and now of collectives, tinkering with their specific constellations, values and identities in the entangledness of multiple household practices.

Main text: 9483 words

Introduction: A practice-based, collective approach to health promotion

In later years, the most prevalent methods for public health communication and the prevention of non-communicable ("lifestyle") diseases on a policy level have focused on the individual, and relied on motivation and information as foundations for change (Halkier, Katz-Gerro, Martens, and Hargreaves, 2011; Hargreaves, 2011; Lindsay, 2010; Walls, Peeters, Proietto, and McNeil, 2011). Social scientists have criticised this approach for ultimately turning poor health into a matter of individual blame(Cohn, 2014; Nettleton and Green, 2014; Henwood, Harris, and Spoel, 2011; Horrocks and Johnson, 2014; Jespersen, Bønnelycke, and Eriksen, 2013). Furthermore, the

individually focused approach neglects the social dynamics of the everyday life, and the significance of social, cultural and structural conditions for health (Bloch et al, 2014).

The field of health promotion has evolved as a counter-reaction to the hegemony of individually focused and medically dominated approaches to public health (Green, 2010). Health promotion combines a focus on empowerment and education of individuals with settings- and community based interventions and public policy perspectives, to encompass structural, social and individual determinants of health. The aim is to develop knowledge, values and skills required for individual decision-making, but also to foster environments that support a healthy lifestyle (Green, 2010). Significant work has been done on the importance of family and social relations for individual health and wellbeing, and the relation between family socio-economic status and individual health (Adamo, Langlois, Brett, and Colley, 2012; Diderichsen et al., 2012; Wilkinson, 2003). However, addressing individual health through the family or community entails an ontological separation of the individual from its socio-material relations, reducing these to context for individual health and wellbeing. The settings approach, for instance, has, despite its community and infrastructural perspective, been criticised for being a disguised individualistic approach with behavioural targets (Green, 2010).

Recently it has been argued that a focus on practice better captures the social dynamics, power relations and inequalities of daily life that make lifestyle a matter of more than individual behaviour (Cohn, 2014; Frohlich and Abel, 2014; Horrocks and Johnson, 2014; Maller, 2015; Nettleton and Green, 2014; Veenstra and Burnett, 2014). A practice approach understands actions as produced by, and continually reproducing social structures, and human action as embedded in practice (Schatzki, 2001). These practices are the routinized doings of the everyday, that consist of elements of meaning, competences and materials (Shove, Pantzar, and Watson, 2012). In a practice-perspective, health practices are thus the activities, values, discourses and knowledge that pertain to health, and which are mobilised in the active doings of the everyday. To create change, interventions must engage with these different elements of practices, in the everyday where they unfold.

Practices are shaped both by inner logics and outer relations, and can enforce or constrain each other. Health-related practices such as exercise may thus take form in relation to practices of family life, work, parenthood, consumption and more. Here we focus on physical activity as a part of health practices, due to the focus of the PULSE project, recognizing that the delineation between the different practices might not be very clear in the everyday performances, where the

practices can be so entangled that distinctions between them dissolve(Shove et al., 2012). A focus on practices understands everyday life as socio-material processes where not only social relations, but also material artefacts, the home, community and different practices shape everyday doings. From this perspective, individuals become *practitioners*; carriers of practices, whose actions are shaped by the logics of practices. However, practice theory also tends to harbour a bias towards the practitioners rather than the practices, thus reproducing the focus on individuals (Pink, 2012; Shove, 2010).

Conceptualising households

We suggest adding a collective perspective to a practice-based approach. In this article, we situate the practitioners and practices of health and physical activity in *household collectives;* assemblages of persons, social relations, discourses, materiality and processes (Jespersen et al., 2013; Moreira, 2004). The household is a node for practices, gathered by the activities that draw together and align actors in collective practices of everyday life. The household collective as concept provides an understanding of how the social and material organisation of everyday life shapes the conditions for the individual. The household has traditionally been a central notion within cultural analysis, focusing on social organisation based on production and the division on labour dependant on societal structure, seasonal changes and different life stages (e.g. Christiansen, 1996; Højrup, 1966; Löfgren, 1972; Stoklund, 1985). Recent work has studied families, homes, and everyday life in relation to material culture, consumption and sustainability (e.g. Pink 2004, Miller 2001). However, the household has often been approached as the context of study rather than the object of study in itself (Casimir and Tobi, 2011). This has meant a significant lack of conceptualization of the household.

Based on an ethnographic study on family health and everyday life, we provide a framework for understanding the household as a collective, and conceptualise everyday health 'behaviour' and lifestyle as complex, collective practices. We suggest taking a point of departure in these collectives as a target for health promotion. The collective efforts in the households orchestrate and coordinate everyday activities, and are fraught with emotions and affect, ideals and values. In this vein, health and physical activity practices must be understood as collective matters, and as integrated in the making and maintaining of households.

We describe how practices of health or physical activity are performed in collectives. We note how the household collective tends to take precedence over individual preferences, and how

individual behavior has collective implications. In the everyday efforts of the households to live up to ideals and maintain balance within the household, the dynamics and tensions between practices require alignment, coordination and choreography (Jespersen, Bønnelycke, and Eriksen, 2013; Lassen, Bønnelycke, and Otto, 2014). This balancing work makes healthy living about more than simple, individual choices about whether to follow health recommendations or not. Changing behaviour is rarely just a matter of knowledge and motivation. We need to understand physical activity and health through other practices that do not necessarily have health as their main focus and meaning, and which are situated in households.
This attempt to conceptualise a household is meant as a broadening of the notion of family to encompass familial relations within a socio-material framework that includes a wider set of dynamics, relations and processes. The concept of household does not aspire to replace family; rather to add to and situate it. We still employ 'family' where it makes sense to describe a kinship-based unit and the human members of the household, reflecting the lay and everyday use of term by the participants.

The PULSE project

This article is based on ethnographic fieldwork amongst Danish families with children as part of the PULSE project, running 2013-18. PULSE is a collaboration between the Danish research centre Steno Diabetes Center Copenhagen and Danish science centre Experimentarium, with the aim to develop research-based methods for promoting health – and physical activity in particular – amongst families with children aged 6-12. The research was conducted with the intention to provide knowledge about the health practices and family life of the target group, to inform the intervention development process. Based on a collaborative design process between health promotion researchers, science center practitioners, and target groups, the PULSE project designed a health promotion exhibition, community outreach activities, and an app to increase everyday physical activity. With backgrounds in social studies of science and health, the researchers also engaged in a study of the projects' performance of health promotion in a science centre setting, thus striving to perform a 'double cultural analysis' which Jespersen et al coin as '*ethnographies both for and of the involved corporations, business and public and governmental organisations'* (Jespersen, Petersen, Ren, & Sandberg, 2011, 6).

A household-centred methodology

The first two authors conducted ethnographic fieldwork in two neighbourhoods in the Copenhagen area (Hammersley and Atkinson, 2007;Tjørnhøj-Thomsen & Whyte, 2008). Participants were recruited via advertisements in local newspapers, posters and communication through the local housing association and neighbourhood renewal project secretariat, who also helped recruiting via networking, and snowballing (Streeton, Cooke, and Campbell, 2004). Fifteen families with children aged 6-12 participated in the study. The fieldwork took place from November 2012 to April 2013. Of the participating families, 9 resided in houses or villa apartments in a residential neighbourhood. The other 6 families lived in rental apartments in housing blocks. There were 4 one-parent families; in one of these the parent was unemployed. We selected and developed qualitative methods that involved the whole household, in their home, in order to get insights about the families and their practices in their context. We combined family interviews and observations with cultural probes in the shape of calendar and photo exercises (Gaver, Dunne, & Pacenti, 1999; Hammersley & Atkinson, 2007; Spradley, 1979; Tjørnhøj-Thomsen & Whyte, 2008). For the photo exercise, the families were given cameras for a week and asked to take pictures of physical activity in their everyday life. The interviews were loosely structured by an interview guide, focusing on the everyday routines of the families, family time, physical activity and health perceptions and practices (Halkier, 2008; Staunæs and Søndergård 2005). With point of departure in the photographs, the interview guide was supplemented with questions about the motives and meaning of the families' specific photos. The families were also asked to do a calendar exercise, where they mapped the activities of all members for a typical week. The probes were means of spurring reflection on otherwise mundane and taken-for granted topics, and provided a starting point for household interviews about everyday activities and routines (Pink, 2012; Spradley 1979). This had the aim to involve all household members in the exploration and discussion of their everyday lives, and to not favour only verbal representations. Furthermore, they served to get insights beyond the spatially and temporally limited interview session (Keats, 2009; Pink, 2006; White, Bushin, Carpena-Mendez, and Ni Laoire, 2010). Interviews lasted between 90 and 120 minutes, and were recorded and transcribed or condensed. Notes and interviews were coded and analysed thematically (Clarke, 2003). The authors analysed the material for recurring themes, focusing on family roles and relations, types of physical activity, motivational factors and barriers for physical activity, use and significance of the surrounding environment, family activities and

wishes for communal family activities. The themes were narrowed down to five; *motivation, a family outing, work and gender roles, health, and media and games*, which were presented and discussed with the PULSE project design team and local stakeholders (e.g. municipal health centres) to discuss their relevance, accuracy and applicability in terms of developing health promoting methods.

Because the fieldwork focused on heterogeneous practices, and thus focused on both sayings, doings, people, places and materiality, the empirical material was extensive and rich. To conceptualise the complex enactments of the household collectives, we need to unfold these enactments in their richness, and we therefore employ rather long empirical excerpts in this article.

Methodological considerations

As will appear in the following sections, all the participating families emphasised the importance of physical activity and expressed aspirations to live up to ideals and recommendations. They all recounted struggles to reconcile these ambitions with the complex, collective realities of everyday household life. There is, of course, a possibility that our methods, asking the families to reflect upon physical activity in their everyday life, might result in physical activity and health being given more prevalence in the interviews and probe exercises than in actual everyday practice. It is imaginable that families with an affinity for health and physical activity were more likely to be willing to participate, resulting in a bias. We concede that families might present us with self-representations that are considered desirable, but we also believe that it relates to the fact that health and physical activity are topical in public discourse, and consequently permeate many everyday practices. The ubiquity of these ideals and values, and the frequent referral to them by the families, indicates that they play a powerful role in the building of household practices, identities and meanings.

The household collective: Multiplicity and (dis)concerted efforts

In this section we apply the notion of household collectives in our analysis of the health practices of the PULSE families. The first interview takes place on a Sunday afternoon in the kitchen in a villa in an affluent Copenhagen suburb. The family is working on the calendar assignment. Sometimes the whole household is gathered around the table, but most of the time one or more

of the household members are elsewhere; children are playing or fighting, adults are going to and from, trying to keep the children under control or taking care of ad hoc practicalities.

Excerpt from field notes 2 December 2012: Household A: Mom [37 years], Dad [40], Grandmother [70], Son 1 [6], Son 2 [4½]

> [Mom] and [Son 1] talk about what he does during the day, and she puts some pictograms on the calendar for him. [Son 1] asks if anyone has seen his mittens. [Dad] looks at the calendar and talks about when they do grocery shopping, which has to be done between work and dinner; there are so many tasks in that hour. [Son 1] suggests putting Nintendo on the calendar, and [Mom] says that TV, computer and Nintendo are all very sedentary activities, as if reluctant to put them on the calendar. They talk about whether there is a difference between summer and winter regarding their activities, and [Mom] says they are outside a lot more in summer. [Son 2] comes over to the table, asking what they are doing. He points at his calendar days and the pictograms that [Mom] has put on. [Son 1] wants [Mom] to give him some soccer pictograms as well, but she says no, only [Son 2] has practice there. [Mom] tells, that she does the family's laundry, and sometimes there is an unbelievable amount; it is all over the living room. She thinks she spends a lot of time tidying, cleaning and vacuuming. Instead of a pictogram she draws a vacuum cleaner, and [Son 1] tells her to draw some dust as well. [Mom] discovers that [Son 2] has put in some random pictograms, and she removes them. [Dad] comes to the table and says he has to go to work now. (…) [Mom] asks [Grandmother] if she can take the boys to the stadium, and she says yes, but she has to go home and get the car. The interview starts breaking up as everybody leaves the table and starts doing other things. [Mom] and I talk about the unfinished calendar and whether we should set another date to finish it. [Mom] decides to quickly fill out the rest for the entire family instead. She sits down while the others buzz around and there is general commotion. [Dad] says 'bye' and leaves. [Mom] and [Grandmother] remain at the table for a while, discussing what their days look like. [Mom] puts some pictograms on for [Grandmother]. [Son 1] comes over, complaining that [Mom] hasn't put on more soccer for him. She ignores him while talking, and he starts yelling: MOOOMM! [Mom] hushes him. [Grandmother] says that [Dad] worked today before the interview as well; he works all the time, she comments. [Son 1] wants his mittens NOW, and [Mom] says he can go get a pair in his room. He says there aren't any, and that [Mom] has to go with him. She says [Son 2] can go with him instead. The boys go upstairs. [Mom] has now pretty much completed the calendar. She says it is fun to see their days like that; it gives a better idea of how they are structured. [Son 1] yells MOOOMMM, from upstairs, he cannot find his mittens and he comes down again and starts yelling MOM-MOM-MOM-MOM continuously until [Mom] gets up and starts telling him off. He starts crying, and [Mom] comments that now both boys are becoming rather impossible. [Son 2] is running around in the kitchen and the level of noise is rising. [Grandmother] has left the table too, trying to help. I [Author 1] quickly gather my stuff to leave.

This excerpt discloses the multiplicity of practices and the heterogeneity of the collectives. It demonstrates how any mundane situation in a household collective can be a matter of concerted efforts to coordinate and align different agendas and activities. The interview is crosscut with disputes, conciliations and constant work of alignment to make it all come together. Dad's work,

Mom's attempt to make everyone participate in the interview in an adequate manner and giving the right representation of the household, are juggled within the collective, alongside the management of ordinary household activities, such as getting the boys ready and keeping their fooling around on a minimum. Sometimes mittens, cars and laundry are quite powerful actors in household practices. Most of our interviews were fraught with numerous different topics and events that at the time were more significant than the intended topic of health and physical activity. Throughout this interview, Mom talks more about the housework and logistics of running the household, and of work challenges and schedules, than actual physical activity. The fact that physical activity does not take up lots of space in this excerpt is a point in itself: Often the interviews were more about the constant efforts of keeping household collectives together, of making it work, and not coming apart in the attempt to incorporate more physical activity, be healthier, and living up to ideals and recommendations. The excerpt serves to introduce a methodological point about the challenges in doing research with families, but more importantly, it unfolds the complexities of the everyday that need to be addressed when aspiring to create health promoting interventions.

The excerpt demonstrates clearly, how the home is a stage for many different enactments at once, resembling a central station or command centre. If one agenda changes, the constellation shifts. We note how Mom, in the hectic activity and breaking up concluding the interview, seems to become the conductor of the orchestrated activities of the household. The collective sustains a distributed network of activities and responsibilities which are arranged according to its immediate composition. The researcher's presence also shapes the immediate composition and interaction of the collective, as an extra actor is introduced, and a specific setup is arranged in the interview situation. Certain enactments take place because of the researcher's presence, and normal processes are disrupted because of it (indeed, part of the chaos that often would arise stemmed from interviews – by regrettable necessity – being arranged in the critical hours post-work and pre-dinner and bedtime). The activities the researcher introduces, giving collective assignments and spurring collective reflection, become processes that gather the collective and constitute them in a certain way. A particular dynamic is created around the agenda of discussing health and everyday life, poking for openings to intervene and create changes through the PULSE project activity designs. The interview thus becomes performative; the collectives become visible and constituted through the researcher's presence.

Collective time and bodies

The Danish health authorities recommend 30 minutes of physical activity per day for adults, and 60 minutes for children (https://www.sst.dk/en/health-and-lifestyle/physical-activity). Many families biked to and from work or school, and would thus, by this alone, approximate the 30 minutes. Typically, the adults would furthermore strive to attend organized sports or the gym on a more or less regular basis, ranging from once in a while, to once or twice a week. Often, the children would go to several activities a week, whereas the parents would get less exercise. In general, families expressed awareness of existing recommendations for physical activity, and recounted their efforts to live up to them, or their ideals about living an active lifestyle. A recurring ideal amongst fathers was doing a marathon:

Excerpts from interview Household B 17.12.12: Mom B [37 years], Dad [41] Son 1 [6], Son 2 [4]:

> Dad B: *Well, I'll be happy if I just get a run now and then. I ran a marathon many years ago, and I could dream of doing that again – but it probably won't be before the kids are older. (...) But so many [family fathers] are so busy doing Iron Men and the like, and sometimes there might be some other issues behind that. In my experience, they are typically the ones that get divorced, I'd say. But that might just be sour grapes [laughs]. (...) My ambitions have lowered, but I'd like to run a marathon again.*

The father's contrasting with those that do Iron Men with a mix of distance and badly concealed envy is not a singular occurrence. The 'extreme sport' tendency that has flourished in the later years did not go unnoticed amongst the parents, who expressed ambivalence about it, but still, it was frequently enough mentioned to seem to serve as a sort of unattainable ideal. However, as his wife expresses, that would be too costly for the family:

> Mom B: *A lot of men these days to a lot of extreme sports and Iron Man and the like, and they 'get permission', quote, to be away most nights, but then it must be a special family constellation, where there is an agreement about that. Then you've agreed that it's like that for a year, or you've decided that it's that kind of relationship you have, but then you're never together.*

Mostly, there were more pragmatic wishes for 'just a bit more' in the everyday, such as the father's wish to do a few runs or gym sessions a week, which is, in fact, quite similar to Mom's sense of what would be adequate:

> Mom B: *I guess you could, one morning a week, go to the gym or something, some people do that (...) And then the daily bike-ride, when it isn't snowing, that means the world.. And then if you could just run once in the weekend, and one other day.*

However, the parents feel that it is not feasible for both of them to do physical activity on such regular basis – it would mean a constant calendar management and negotiation:

> I: *Do you experience that you have to negotiate about who has time when, and who can do what? Do you disagree?*
> [Mom B]: *Well, not disagree... But we would, if we weren't considerate. Because it's obvious, you can't be away every Thursday for yoga, and then on Tuesdays not come home until… Every time I get home at 8pm, [Dad] has to be home at something-early to pick up the kids, cook, and be there for them. So it's a constant puzzle with those schedules, and if you're gone there, then I can't be gone there, and then you have to be careful not to have one or more weeks in a row where you aren't home. So... We do have a gym up here, where you could go at 9pm, but I mean…it's just…*

As expressed in this household, there is a collective economy of time, and the cost of physical activity has to be weighed. In this household, one set exercise session a week for each member 'costs' too much in terms of the family's time together, career and friendships, and Iron Men must be paid in divorces.
Parents expressed that taking time for themselves meant taking time from the household. Their bodies were not their own, and neither was their time; it all belonged to the collective pool of resources. As another dad puts it:

Interview excerpt Household C, 29 November 2012: Mom (41), Dad (48), Twin boys (7)

> Dad: *It [has to] fit into the family, that you can plan around the rest of the family, so that when you see you've got an hour, then you [take a run]. We kind of just adapt.*

This dad furthermore describes how at present he cannot run because of an injury, so instead he tries to make his wife run more. So the time and energy he normally would spend is reallocated to the spouse, whose increase in physical activity somehow evens out the collective score. The physical activity, health and wellbeing of each member affect everybody in the collective. In another household, the mother has recently been diagnosed with diabetes, and the collective practices change because of it. She becomes grumpy and less tolerant of sugar if she does not exercise frequently, which means that the father is on the watch for warning signs and sends her out running when the mood drops. He started running too, and the daughter sometimes accompanies her mother on runs. On weekends, the often physically demanding household activities, such as playing, cleaning and gardening, makes Mom's blood sugar drop significantly, and she has to regulate her diet accordingly. Mealtimes are strictly regular because of it. The whole household is attuned to her body, moods and activities. Physical activity is rarely

undertaken by singular bodies – but by multiple, collective bodies. The practices of the household collectives create household time, household health and household bodies. Bodies that interact and share loads of work and perform physical activity in choreographed, interdependent actions (Jespersen et al, 2013).

Excerpt from household interview and field notes, 2 December 2012. Household D: [Mom] 47 years, [Dad] 54 years, [Daughter] 6 years.

> Every morning while the rest of the family sleeps, [Dad] gets up and takes a run, a ride on his racing bike, or a 1 km swim in the sea. He combines it with strength exercises on the living room floor. He bikes to work, but does not think it counts to give 'enough' in terms of exercise. He also attends volleyball a couple of times a week. For [Dad], exercise is something to do alone, without the family.
>
> [Dad]: *"Everyone around me knows that I am the one doing the most exercise in my age group [laughs]. If I don't do something every day I don't feel good. (...) I always take the stairs and I try to motivate my colleagues to do the same. Some of them are a bit lazy and prefer the elevator. But when we have meetings together, the elevator is banned. Then it's the stairs!"*.
>
> There are some photos of [Mom] walking up and down the stairs at home, carrying laundry baskets or bags of groceries. She tells me, that she walks those stairs countless times each day; that is housewife-exercise. [Dad] works a lot and is often on business travels, so [Mom] works part-time to have time to take care of [Daughter] and the house. [Mom] drives [Daughter] to and from school and activities and does most of the housework. It is quite strenuous, she thinks, carrying clothes and groceries and things up and down the stairs. She bikes to and from work and everywhere else the family goes, because [Daughter] does not like driving in the car, and the family has a large carrier bike, which they use a lot. That is also exercise, [Mom] comments. It features on quite a few of the photos with [Daughter] and [Mom]. [Mom] does not think she gets enough exercise, and she thinks she ought to do some fitness for her back. She would like to go to something like Zumba. [Dad] thinks it is a question of motivating yourself, but [Mom] does not think it is that easy, when she can only go after [Dad] has come home, and you never quite know when that is. She does not like that she cannot plan when she can go, and set herself up for it. In general, she thinks it is hard to find the time (…) [Mom] would like for them to exercise together, so they could unite family time and physical activity. But [Dad] is not too keen; he thinks it is difficult to find something to accommodate their different fitness levels.

This excerpt illustrates the mutual contingency of the different actors in the household collective. In this household collective, a framework has been established around Dad's exercise practice, which supports it and makes it durable. The agency and possibilities of each member of the collective is defined and negotiated by the relation to the other members, as each possesses identities, and is *enabled to perform specific actions* in relation to the others. The household collective in itself also requires work to be maintained and managed, resulting in a distribution of labour and roles amongst its members. Mom's routines of housework and exercise are completely oriented towards the needs and doings of the rest of the household. She takes care of

the household chores and supports Dad's demanding work hours and business travels by managing Daughter's activities and transporting, cooking, helping with homework and looking after her. Mom wants to exercise, but it conflicts with her role as the caretaker of the home front, attentive mother and corporate wife. Cultural values regarding division of labour and responsibility for the upkeep of the home play a significant part of the positioning and roles of the members of the collective, and there are clearly aspects relating to gender roles and identities in these home practices. There are also different values about how and why physical activity should be performed, with implications for household roles and identities. A good exercise practice for Mom has to be compatible with her labour to maintain the household, and with being together as a family. For Dad, doing strenuous exercise is a part of his self-image and professional position. In line with dominant existing discourses on physical activity, he sees exercise as a matter of individual motivation and performance. Dad adheres to recommendations for physical activity designed for individuals, with individual bodies and individual time, driven by personal motivation and drive. But in a collective perspective, his 'breaking free' of the collective means the redistribution of activities and tasks, and invisible caring practices are necessary to support his activity. The struggles of the family to make household practices work despite Dad's individually based exercise stress how each member's time, activities and even bodies are not individual, but collective matters. And physical activity is not an individual practice, but a household practice. In specific instances individuals emerge and appear to be singular entities – as Dad whose exercise practice is easily attributed individual motivation, strength and action. However, Dad is able to appear as an active and self-disciplined sportsman as an effect of the efforts of his household collective.

The excerpt discloses frictions in the encounter between an individually based discourse on health and the collective realities that unfold in the household. It also depicts the household as a scene for affect and emotions, marital tensions and as a foothold for assembling a professional career and identity to present to the world – which all affects practices of physical activity.

The distribution of roles and tasks

In household D, the distribution of labour is organised around a traditional gender role pattern. We often experienced gender patterns regarding the distribution of roles: Mothers were often more oriented towards the practical management of the collective, whereas fathers were less dependent on the collectives, and more individually oriented. This pattern would be enabled by

the collective constellation – such as, as expressed by family B, by obtaining permission to do an Iron Man, or mothers taking care of practical chores to enable fathers to be 'at liberty' to do more 'fun stuff'; relax, play with the children (or, as in the cases of households A and D, working longer hours):

> Mom B*: I'd love to say that I took a run [while the rest of the family is swimming], but it's more like – just tidying up a bit, doing chores while they're gone. (...) Then I have a couple of hours for cleaning up a bit, right.*

> Mom C: *[Father] and I are very different: He can easily sit down, even though everything's a mess, with food and laundry everywhere. (...) I can't relax if the house looks like chaos, and there's dishes and laundry – there's a lot of that. Then it's VERY hard for me to just sit down and relax.*

Interview excerpt Household E, 7/1-2013: Mother [37 years], Father [43], Son 1[8], Son 2[5]

> *Son 1: She[Mom]is boring*
> *I: Then what do you play with your mom?*
> *Son 1: Dunno. I cook with her, and, like, do home-like stuff (...) With Dad and my little brother I do more wild stuff. So Mom's pretty boring, but she's nice to be with. But Dad's just so much better – I mean, more fun.*
> *I: So there's a boring one and a fun one?*
> *Son 1: Yeah. But it would be sad if she was fun as well, because then I wouldn't have anyone to be homely with.*

As these excerpts express, there are certain roles that need to be filled and tasks that need to be done, and someone has to do it. Mom C cannot ignore the calling of the dishes that demand attention; the household steers her. That, on the other hand, enables Father C to respond to the calling of the couch. As Mom B expresses, the ideal of her 'choosing' to go running on a Saturday morning while the boys go swimming, is illusory, because that time slot is allotted for domestic chores. There is no 'individual leisure time' in which to exercise for her. The roles are finely balanced, and changing these roles requires readjustment – if Mom E starts being 'fun', then who can be homely instead? For these mothers, the management of the household takes precedence over individual preferences, and for the fathers, individual activities are enabled by supportive household practices.

Health and parenting practices

Health is an element in many practices, and many different practices influence exercise practices. The motivations for doing physical activity described by our families thus range from health reasons to social reasons, from the need to simply feel good, to learn a skill, teach the children about perseverance and responsibility, or just letting off steam. Active, healthy living is also part

of a good parenting practice and the good family life. In all the study's families, parenting practices and the children's needs take supremacy, shaping the enactment of all other practices. For most of the families, exercise and health are part of performing family life and enacting a home, but at times they also conflict. In Mom B and D's cases, practices of making a home and performing family life the right way conflict with performing exercise and health. The 'right ways' of doing family life – being there for your children, having 'relationship time', going on excursions together – are hard to reconcile with the 'right ways' of doing exercise, which for most households is qualified by being intensive, time-consuming, formalised and measurable ways of doing physical activity. The daily bike-ride to work is not enough.
For some, though, exercise practices and family practices can go well together, if the right frameworks are established to support a collective practice that unites family time and togetherness with certain forms of physical activity.

Excerpt from field notes 29 April 2013. Household F: Mom [in her 40'ies], Son 1 [18], Son 2 [17], Son3 [6], Daughter [5]

> Household D lives in a 5-room rental flat in [rental housing area], an urban area in Copenhagen. [Mom] is a sports pedagogue [*idrætspædagog*] and reports being rather active in her daily work and through biking for transport, doing housework, and always taking the stairs rather than the elevator to the 4th floor where they live. The two smallest children attend outdoor kindergarten and a public school with a sports focus [*idrætsskole*], respectively. The two oldest boys go to high school and college, and spend a lot of time outside the home. Sometimes they are all home, including the teenage boys' girlfriends, then the household counts 7 members. [Mom] thinks it's a bit challenging to not always know how many they are going to be at mealtime. (…) The photos taken by the family depict different places around the neighbourhood where you can play and move your body in different ways. [Mom] strives to get playful movement of the body into every day with her children, especially the two smallest. They cannot get far away from the home as they do not have a car, but they bike around and use the local neighbourhood. They find places where they can play and romp about on their way to and from school or the supermarket, making every outing a possibility for physical activity: Balancing on fences and kerbs, jumping up and down benches in parks, rolling over bars, jumping, climbing, and running. [Mom] does not have the money for organised sports as she is newly divorced and sole provider for the household, and she is not able to transport the children to all sorts of activities all by herself. So she tries to find new ways of moving and challenging the body all the time.

In this household, the values and norms of parenting and being together are aligned with physical activity as something that can be performed together. Even though Mom is not able to fulfil her personal aspirations, physical activity has successfully been made a collective matter despite

limited resources. Other dimensions of health are less easily reconciled with the household's other practices and circumstances:

Interview excerpt, household F, 29 April 2013:

> [Mom]:"…before the divorce candy was for Friday night only, and I was very….I've slacked a bit on that, so… But there's fruit and veggies every day, and there's fruit and veggies in the lunchbox, and there's rye bread, and most of the time we make the bread ourselves, if we're having wholegrain buns and such, and I'm trying to stick to the rule that you have to eat greens and fish and the like, but it's hard to make it all come together. I think it's hard, because I think health takes up a lot of time, and in my mind I'd like to live like that, but sometimes it just can't be done, and sometimes you just have to breathe and go "okay, that's how it is", because I'm all they've got, and I've got to take care of myself too, and I have to breathe. I'm not cooking for an hour in that kitchen, I'm just not.

Household life is never just about health, about one person or one situation, but always crosscut with agendas and other actors, times and places. Past and future trajectories of practices are entangled with the doings of the moment, as previous experiences and events have impact on present and future ones. The excerpt illustrates how any glimpse into an everyday household scene is a temporally and spatially delimited fragment of the multiple processes that take place in everyday household life. For this household, a divorce has entailed significant changes in living conditions, emotions and energy levels. There are many mouths to feed, and the collective fluctuates, so there are constant adjustments and redistributions to be made. Sometimes tasks are shared, and the load is easier, as featured on their photos of communal cooking and dishwashing, on the other hand the diversity of members complicates matters and multiplies needs and concerns. These struggles make it clear, that living a healthy and active lifestyle is not only a matter of rational decision-making. Health campaigns and messages conveying health facts and recommendations about lifestyle are not enough to help drive a change in the tangle of everyday practices. [Mom] knows what would be the best way of eating, exercising and in general living healthily. The problem is to make this work in the everyday, where many other factors interfere. So [Mom] does as well as she can, and sometimes that means slacking or giving yourself time to breathe. Healthy and active living is not about choosing, it is about navigating; which consists of "… *continuous relational accomplishments in intersections of multiple practices in everyday life*" (Halkier and Jensen, 2011). Navigating between practices might not be consistent or calculated, but results in pragmatic and sometimes inconsistent compromises.

Conclusion: A collective approach and its implications for health promotion

In this article, we have conceptualised families as heterogeneous household collectives, gathered by common and intersecting practices. The household collectives consist of shifting constellations of actors, and their activities and positions are contingent on the practices and trajectories of the collective. The work of producing and maintaining households requires collective efforts that take precedence over individual preferences. Being embedded in these household collectives, health and physical activity are conceptualised as collective practices that cannot neatly be delineated, measured, or enacted as solitary subject (Yates-Doerr and Carney, 2016). In certain situations, some members emerge as individuals, as a result of the orchestrated efforts of the household. Each collective has different – and shifting – delegations of responsibility regarding the upkeep and conduction of healthy, social, physical and pedagogical tasks and activities, sometimes explicitly negotiated and expressed, sometimes tacit and routinized. This means that individuals cannot be understood or be the targets for interventions separately from their everyday practices. Health practices within household collectives are based on pragmatic negotiations between actors and navigating after what might work within the practical routines of everyday life rather than individual decision-making. Practices of physical activity are part of the affective and caring practices of the household collective, working to maintain and balance the household constellation on a daily basis. These closely interconnected practices of the collectives produce collective bodies, collective time and collectively dependent identities and roles.

The health practices of the families in our study were interwoven with notions of good family life, parenthood and identity. The families experienced conflicts between moral or idealised notions of what constitutes good family life and good health practices and how to reconcile this with the challenging realities of everyday household management. Their practices of family life and physical activity were defined by the particular constellation of their household collective, and their pragmatic negotiations, and not – contrary to the assumptions shaping dominating health campaigning approaches – by knowledge deficit or lack of motivation. Therefore, a health promotion approach based on information will miss its mark. To promote health in the household

collective means addressing issues of work, time management, marital relations and distribution of labor, and numerous other domestic practices that compete and entangle with practices related to health and physical activity. With this perspective, it is not meaningful to promote or measure health individually, rather, it opens up the work of understanding health as relational, dynamic ways of doing, living and experiencing. Facilitating and supporting change in health practices is thus not about making the individual responsible for making the right choices, then, but about tinkering with the conditions and components of daily health practices; working with bodies, individuals and materialities as collectives. Health promoting efforts need to be located in the practices of collectives in the everyday, being sensitive to the roles, meanings, materialities and localities of health practices and the contingency of different practices and collectives. Rather than working with the health of a singular body or an individual, efforts must be directed at moving collectives towards healthier, collective practices, making space for small everyday changes that affect the dynamics, relations and logics of the collectives.

The insights in this article have been produced as the result of a researcher intervening and temporarily participating in the co-production of particular collective efforts, shaped by the methods, tools and questions brought to the dinner table in the research situation. They created a time and space where collective actions were directed towards the subject of health and the unfolding of health-related practices in the household collectives. When we as researchers or health promotion professionals enter into relations with these collectives, we shape them and participate in the creation of particular situations where households are enacted in specific ways; where actions are orchestrated and attentions attuned towards health matters. In this convergence of actors and processes we have created a health promotion situation, rather than an intervention. It is temporarily and socio-materially specific and cannot be reproduced. Health promotion efforts must thus engage with here and now of the collectives, producing situations that rearrange the collectives, tinkering with their specific constellations, values and identities in the entangledness of multiple household practices. The conceptualisation of household collectives thus bears consequences for future health interventions. When planning interventions that aim at e.g. increasing the level of physical activity, the intervention will have a better chance of success if the conditions and priorities of the given collective is taken into account. This is due to the fact that the intervention has to engage with the practical realities of everyday household management and everyday life if health practices are to be changed. This need not to be an immense task; involving the household collective through a collaborative approach in the

process, and identifying goals and possibilities collectively, with a continuous consideration of the collective costs and implications, will situate the health promotion efforts. This approach differs from fixed tool-kit approaches to health promotion because situated interventions are to be carried out in and with collectives. The households are based on a meticulous work of checks and balances – an economy of time, bodies, values and activities. A collaborative and context sensitive approach here becomes imperative, recognizing that even the smallest changes have implications for the cohesion and arrangement of the collectives. Formulating sustainable health interventions taking departure in everyday practices of the collective(s) is one of the most pertinent tasks for health promotion.

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Article 2: *'Well, they kind of participated in a different way'*. Modes of participation at the science centre

Paper for Journal of the Learning Sciences

Julie BØNNELYCKE

Steno Diabetes Center Copenhagen, Niels Steensens vej 6, building NSK, 1.11, DK-2820 Gentofte and

Copenhagen Center for Health Research in the Humanities, Saxo Institute, University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark

E-mail: frx538@alumni.ku.dk

"Well, they kind of participated in a different way": Modes of Participation at the Science Centre

Abstract

With the participatory turn, science centres and museums are positioned as settings for the performance of democratic citizenship through participation and dialogue on socio-scientific issues. Participation is often conceptualised as a prerequisite for creating inclusive, relevant and sustainable learning experiences. However, participatory approaches tend to favour particular worldviews, values, and subject positions. A prevalent discourse of dialogue connects participation with democratic citizenship, and thus calls on individuals to be empowered by acting out citizenship through controlled and calm deliberation. This is a form for participation that favours discourse and formalised creative exercises over bodily, material or caring modes of engagement. When working to increase inclusion of underserved groups, this biased approach risks enforcing mechanisms of exclusion rather than mitigating them. Based on the empirical work of project on designing health promotion in a Danish science centre, this article conceptualises the health educational designs as socio-material events that afford different modes of participation. This approach articulates how participation unfolds in subtle, chaotic, material and bodily modes that enable underserved users to participate in a variety of ways that accommodate different practices of community, care, health and wellbeing.

Key words: Ethnography, Health promotion, inclusion, participation, science centre/museum

Introduction

Participation: A Prerequisite for Democratic Learning

Creating participatory learning processes is often conceptualised as fundamental for providing sustainable, relevant and democratic education. This is to be achieved through the active involvement of learners, granting them control and ownership over the learning process (Reid, Jensen, Nikel, & Simovska, 2008; Simovska, 2004, 2007). Across professional fields concerned with education, and throughout contemporary democratic societies, a powerful and widespread

discourse of dialogue, participation and empowerment articulates participatory knowledge production as the key to empowerment and the education of responsible, critically reflective citizens (Phillips, 2011). This discourse defines dialogue as the ideal format for deliberation. Thus, participation is predominantly conceived as a discursive practice, to the exclusion of bodily, material and affective aspects of engagement (Davies, 2014).

The field of education seems to favour a 'culture of participatory workshops' that mobilises a rather uniform set of methods and understandings of how participation can and should be enacted (Reid et al., 2008). Often the philosophy is 'the more, the better', and the more control over the process, and the more active the involvement of the learners, the more genuine the participation (Reid et al., 2008). Therefore, approaches to participation harbour a bias, more often focusing on formal processes of participation, to the neglect of informal, more culturally specific kinds of participation (Hart, 2008). In this conceptualisation, workshops, creative design exercises and reflective discussions become the golden standard for participation. Consequently, participatory approaches tend to favour particular worldviews and values, and accordingly certain kinds of democratic citizenship: Thus the empowered and learning subject is a participating subject, and participation becomes both a privilege and an obligation: To contribute to personal and societal development; to let yourself become empowered.

Concerns have been voiced about the culturally contingent definitions of participation in relation to empowerment and democracy, asking whether other, less individual-based and more collective-oriented ways of conceptualising practices of participating could be equally recognised for their participatory value (Hart, 2008). Furthermore, participatory projects are often evaluated according to these implicit norms of participation, assessing the degree of participation, and whether they can be considered token or genuine (Eg. Simovska, 2007). This implies a normative distinction between 'right' and 'wrong' ways of performing participation and that participation is to be measurable and comparable. Educational researchers debate, for instance, whether 'obligatory' participation due to funder demands or political interests, or participation as a means to achieving a pre-defined goal, can be considered legitimate (Reid et al., 2008).

These concerns are certainly justified and important, especially in a time where participation has political favour, and is often mobilised to promote political agendas. The close association between participation, education and democracy makes it particularly pertinent to scrutinize processes of inclusion and exclusion. As social exclusion often has cumulative effects (Kinsley, 2016), it is important to consider whether the discursive construction of participation in itself has excluding effects, and if other means of conceptualising participation might enable more inclusion. Davies (2014), Horst (2011) and other scholars of science communication have discussed emotional, activist and artistic forms of participation, that were, however, intentional and reflective modes of participation. Here, I wish to focus on how to include non-participating citizens in science and health communication, and to discuss how the science centre can enable the enactment of subtle, chaotic and informal modalities of participation.

In doing so, I draw from my engagement as an ethnologists in a Danish science centre-based health promotion project, PULSE[17], which aimed to create inclusive health education through a participatory approach. Analysing 4 different approaches for facilitating learning and participating performed by the PULSE project, I describe how they enabled different modes of participation, each with their affordances, prescriptions and requirements. I conceptualise these 4 different approaches, each consisting of a different gathering of socio-material actors, participatory methods and processes, in different situations and places, as *participatory events*. Each participatory event offered different relations between science centre and visitor, providing different ways of enacting the science centre as a learning environment and setting for participation.

In the analysis, I engage with how participation can be performed in multiple and heterogeneous ways, some less conspicuous and formalised than other, but no less imbued with

[17] PULSE is not an acronym, but is named with capital letters. The PULSE project description explains the name as signifying the project's focus on physical activity: "*PULSE is rhythmical, a beat of the heart, a movement. (…) The name PULSE reflects the exhibition's goals of learning, fun and improving health*" (Stentoft el al., 2012: 1)

emotion, effort and commitment. Some modes of participation are less discursive and far more material and practical, based on everyday practices of community, family life and social interaction. They take place in everyday settings and involve materiality, technology and bodies, with different motivations and mobilising different kinds of knowledge and competences. In other words, participation can be conceptualised as socio-materially heterogeneous practices, and as such, can take many different forms. Broadening the notion of participation, I argue, helps to recognize and value different kinds of participation, and perhaps learn more about, and be better at creating welcoming learning environments for, the non-users.

The Participatory and Inclusive Museum

Informal learning environments such as museums and science centres (in the following collectively named 'museums') increasingly define themselves as sites for public participation (Mygind, Hällman & Bentsen, 2015). Ideally, the museum of today should serve as a source of knowledge available to all communities, represent the whole of society, promote social inclusion and facilitate dialogue and civic engagement (Black, 2012). Museums have been conceptualised as agents of social change, with the ambition to foster critical debate about socio-scientific issues, to encourage and equip audiences to participate in public debates as competent and conscious voices. Recent work within the field of museum and science learning emphasises the importance of creating relevant, inclusive and engaging learning environments, and museums continuously debate how to ensure the inclusion of underserved groups (Archer et al., 2016; Black, 2010; Dawson, 2014a, 2014b; Sandell, 1998; Simon, 2010, 2016; Streicher et al, 2014). This is frequently approached through participatory strategies that aim to involve audiences in the production of exhibitions or as contributors to exhibition content or debate. Within the museum field the participatory turn construes the audiences as co-producers of knowledge and contributors to new perspectives on socio-scientific issues (Hein, 1998; 2005), framing informal learning environments as sites for public engagement and civic participation.

Participation can be conceptualised in a number of ways and span over a variety of engagement forms; from codesign to looser formats of user involvement in the development process, to any kind of interaction with an exhibit, other visitors or staff (Mygind et al., 2015; Simon, 2010). In her influential work on participatory museums, Nina Simon (2010) defines a participatory institution as "a place where visitors can create, share and connect with each other

around content". In this perspective, participation becomes a means for engaging visitors with the museum, and each other, whether through participation in content generation, co-curating, citizen science or co-developing didactical frameworks. According to Simon, participation is conceptualised as the key to relevance, enabling the audience to engage according to skills and interest, thus providing a democratic way of contributing to the development of museums (Simon, 2010, 2016).

However, critical voices have pointed towards the bias and shortcomings of prevalent participatory approaches, raising the question "*whether museum engagement processes are best conceived as relations of reciprocity or as relations of governmentality"* (Morse, Macpherson, & Robinson, 2013). This points to, how the institutional heritage of museums enmeshes them in power struggles and political agendas and discourses of the surrounding society. By this problematization, the underlying motives and structures of museum engagement are questioned: Whose interests do they serve, and what are the power relations in these processes?

Museums still struggle with mechanisms of exclusion or alienation of minorities and underserved groups, and the majority of science museum visitors tend to be socially privileged, white middleclass or upper-middleclass (Dawson, 2014a, 2014b). Thus, those excluded from museums are those most commonly excluded culturally, socially and politically (Sandell, 1998). Museum-based efforts to create inclusion and participation have been criticised for a tendency to change the target groups to fit into the existing structures and dominating practices of the institutions, rather than changing the institutional frame to accommodate different practices and visitor types (Archer et al, 2016). Contemporary museum-based attempts at promoting participation seem to uphold a bias towards those already interested in and familiar with the informal learning environments.

Furthermore, with their histories of power, politics and economy (Dankl, Mimica, Nieradzik, Schneider, & Timm, 2013), the museum setting tends to support certain configurations of visitors and (re)produce particular subject positions and learner identities. Existing power structures and discourses continuously reproduce participation inequalities and place the responsibility for change on the disadvantaged audience (Archer et al., 2016).

However, little ethnographic knowledge exists about these processes of inclusion and exclusion at museums, and more research is needed to better understand the nature of these

experiences and the extent to which people from a range of different backgrounds could be supported to learn and participate in different ways (Dawson, 2012). To promote inclusion and encourage participation, two questions are particularly pertinent:

Which modes of participation do museums offer the visitors?

Which visitor positions are hereby encouraged and facilitated and which are excluded?

I engage with these questions in the analysis of the PULSE project and the efforts to promote inclusion and promote health based on participation in the project. By conceiving the different approaches to engage users and non-users in PULSE as participatory events, I turn the attention towards which mechanisms of inclusion and exclusion, which subjectivities and social dynamics are enabled through the socio-material setup of the participatory events. By viewing the events as affording certain modes of participation, I point to the implicit norms and values inherent in the notion of participation, critically examining the suitability of the events for achieving their goal.

The approach for facilitating participation in the PULSE project was based on health and science education and entailed certain articulations and ambitions regarding participatory exhibition development. These were challenged as the project unfolded and met with the complex realities of participants and their everyday lives. The envisaged kind of 'formal' participation only involved a small part of the intended users. However, other, less conspicuous modes of participation were enabled, and I recount and discuss how these unfolded in PULSE. These were not formal participatory formats or easily recognisable as such from a discursive-deliberative conceptualisation of participation. Based on my analysis of the different modes of participation performed in PULSE, I argue, that in order to better facilitate inclusion it would be useful to broaden our notions of participation and engagement, including more material, chaotic, and less deliberative ways of participating. I suggest that the ethnographic approach is suited to unpack the paradoxes and challenges of participatory processes, and facilitate participation on everyday terms.

Analytical concepts

Science and sociality, relationality and performativity

In this article, I mobilise an approach building on relational materialism or post-ANT (Law, 1999, 2004, 2007; Law & Mol, 1995). This offers a vocabulary that encompasses the

complexity, interrelatedness and performativity of science, health, the social and the material that are entangled in the science centre. It provides an analytical strategy to conceptualise how participation, visitors and the science centre as learning context are mutually produced and enacted through the different health and science communication approaches employed in the PULSE project.

Inspired by sociologist John Law's (1994) concept 'modes of ordering', I analyse the learning spaces and the possibilities of participation they enable, as modes of participation. Law describes modes of orderings as ordering patterns; recursive logics that are acted out and embodied by agents, who are also effects of these modes of ordering. Law developed the notion of modes of ordering based on an analysis of an organisation (a laboratory), describing it as a socio-materially heterogeneous process of arranging and ordering (Law, 1994). A mode of ordering is described as "*a Foucauldian mini-discourse which runs through, shaping, and being carried in the materially heterogeneous processes which make up the organisation*", containing stories about how things are, and how they should be, and with people written into them in varying degrees (Law, 1994). According to Law, these modes do not stand outside their performances, but are embodied and performed, and are shaped by and shaping the actors performing it. Numerous modes of ordering co-exist, being complex and interrelated. The different modes of ordering produce certain subject positions, forms of knowledge, material arrangements and forms of organisation. Modes of ordering is a concept both pointing towards issues of power and domination; of influencing and restricting possible ways of being and acting, but also enabling and making possible.

Danish researcher in communication and experience design Connie Svabo applied modes of ordering to a museum setting, describing how a number of objects and technologies mediate different 'modes of visiting' (2010). She described these as *"recurring patterns of action which emerge in the associations of visitors and exhibition, they are engagements where the exhibition is mediated in and as a characteristic order"* (Svabo, 2010:122). Svabo analysed how different modes of visiting perform the museum in a different version, and configure the visitor in different ways. Her approach, however, did not elaborate on the implications for institution and visitor position, and the normative dynamics of museum engagement and inclusion. As I am concerned with the values, motivations and implications of the ways the target groups are

enabled to engage with the designs, I modify modes of visiting to modes of participation. I understand these as different ways of performing participation, shaped by the affordances inscribed into the design of the different learning situations. Thus instead of using modes of visiting as an analytical instrument to point to certain dynamics of visitor interaction, I employ modes of participation to scrutinize the relations between intention and values, the design as materialisation of these, and the outcomes in terms of affordances for modes of participation. I discuss which socialities and subjectivities are constituted by this, and their suitability to achieve inclusive participation.

To conceptualise how the science center exhibition design prescribes certain actions, interactions and positions, I draw on the notion of affordances. It was a concept originally introduced by psychologist James Gibson (2013) to describe the possibilities for action provided by an environment for its inhabitant species. Psychologist Donald Norman (1999, 2013) applied this notion to design, as the perceived action possibilities in a given design. A design object suggests or encourages specific ways of acting with or in relation to it. Affordances in a design context become features of situations rather than properties of objects, as they are not fixed, and change according to the relations at stake between users and materiality in a given use situation (Achiam, May, & Marandino, 2014). In a museum, exhibitions are designed to provide certain ways for the users to interact with objects or exhibits, and thus reflect the learning intentions and educational commitments of the institution (Achiam et al, 2014). Hence through its design, a museum exhibit is imbued with affordances and constrictions regarding the ways the visitors can and should act, and in this way it strives to enable or hinder certain ways of knowing, experiencing, moving and interacting.

In other words, the affordances that are inscribed in the learning designs emerge in relation to the users, unfold their potentials in the interactions, thereby creating different possible ways of engaging. Visiting and engaging with an exhibition entails a co-constituting performance of both science centre, exhibition, visitors and the socio-scientific or health issues that they address; different ways of contributing to the continuous performance of processes of learning, producing knowledge and performing practices of identity-making and citizenship: Different modes of participating at the science centre.

In this article, I analyse different modes of participation performed in PULSE, through the description of four different setups of health communication, or dialogic events (Davies, McCallie, Simonsson, Lehr, & Duensing, 2009). I have appropriated the term from Davies et al., to signify the particular participatory ambition driving these particular setups. Each of the setups can be conceptualised as a heterogeneous assemblage of actors and processes, gathered in a certain time and place. These events afford different modes of participating; proscribe certain actions and ways of being a visitor and a participant. Thus certain subjectivities, social relations, norms and values are enacted in these participatory events.

The PULSE project: A science centre-based health promotion project

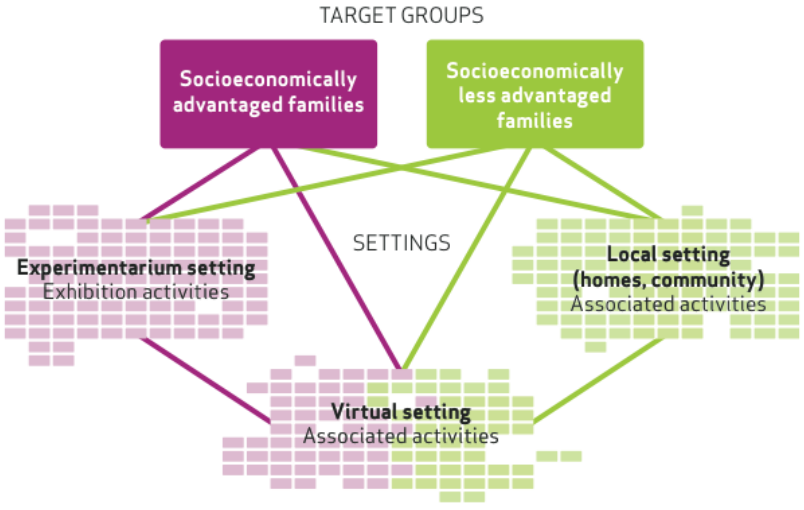
The PULSE project was a collaboration between the Danish research hospital Steno Diabetes Center Copenhagen and the Danish Science Centre Experimentarium, running 2013-18. The goal of the project was to develop new methods for health promotion directed at Danish families with children. PULSE furthermore had as aim to facilitate audience participation and the inclusion of underserved groups. This was done through the design of an exhibition at Experimentarium (opened in March 2015), as well as community outreach events and activities in selected local areas.

PULSE was based on conceptualisations of participation from the field of health education. In the 'democratic paradigm' (Jensen, 1997), participation is a prerequisite for sustainable, equitable and democratic learning. Professor in health education Venka Simovska (2007) describes two common definitions of participation, as either 1) Taking part or being present, which is often mobilised as interactivity or inclusion-oriented approaches, or 2) Having a share, granting the learners influence over the process and content of learning, and sharing power in decision-making. This is presumed to facilitate a sense of empowerment or sense of ownership over the learning process. PULSE can be said to draw on both of the above-mentioned conceptualisations of participation; focusing on inclusion as well as creating a development process that took a democratic and empowerment-focused approach. In that sense, participation was conceptualised as both a means and an end in the PULSE project (Simovska 2007).

The target groups of PULSE were families with children aged 6-12 from two selected areas:

1. The Hellerup/Gentofte area, an affluent municipality north of Copenhagen, dominated by high-priced real estate. Experimentarium is located in this area, which provides the most regular visitors; predominantly families of 'high socio-economic status', i.e. longer educations and higher incomes (Stentoft et al., 2012). They were intended to represent the super-users.
2. Husum, an urban area in Copenhagen with mostly tenement blocks and a high prevalence of ethnic minority groups. It is characterised by high unemployment, low income, low self-reported health and relatively high crime rate. A number of municipal projects have consequently been launched in recent years, including participatory projects such as local regeneration, locally driven social associations and networks and environmental redesign (AAB, 2012). They were intended to represent the underserved/non-users.

This distinction is, inevitably, a generalisation and a simplification of the inhabitants of the two areas, which of course consist of many different people with diverse backgrounds. Even though there were common features amongst the families from the Hellerup area, which differed from those from Husum, these do not signify the existence of two distinct and internally homogeneous groups.



PULSE target groups and settings (Stentoft et al, 2012,7)

PULSE involved four different approaches to creating health learning and participation in PULSE; two user-involving methods: Ethnography and codesign; and two end products: The PULSE Plaza exhibition and the Xbus. Ethnography and codesign were both methods for developing inclusive health communication, and also methods for involving the users in the design process, as the ambition was to make both process and product inclusive, democratic and participatory. Consequently, the development of participatory methods was as much a deliverable as the finalised designs. Therefore, I approach design products and design methods as *participatory events*.

Ethnography

The first stage of the development process was an ethnographic fieldwork in the two neighbourhoods about family everyday life and health practices (Halkier & Jensen, 2011; Tjørnhøj-Thomsen & Whyte, 2008).

The aim was to learn about everyday challenges, needs and opportunities for health promotion design. Methods were qualitative, including interviews, participant observation, and self-documentation via photos, and mapping days of the week and weekend with a calendar (Gaver, Dunne, & Pacenti, 1999; Halse, 2008; Hammersley & Atkinson, 2007; Tjørnhøj-Thomsen & Whyte, 2008). Each member of the family was asked to have the camera for a day to take photographs of objects, situations, persons, etc. of their own choice, relating to movement or physical activity (Reeve & Bell, 2009). Group interviews with the families were performed in their home, with duration of 1½-2 hours. The interviews were loosely structured by an interview guide, and took a point of departure in the photos taken by the families, focusing on their everyday life and routines, family events and outings, physical activity and health practices (Halkier, 2008; Staunæs & Søndergård, 2005).

As part of the outreach design process that specifically focused on designing events that increased participation amongst the residents in Husum, some of the Husum families partook in a mapping exercise, drawing favourite places, routes and hotspots for social and physical activity on maps of the neighbourhood. The emphasis was on having all family members participate and to perform the interviews with the entire family together. However, certain adjustments were made to the methods and focus of the interviews, as will be elaborated in the analysis.

Codesign

The insights from the fieldwork were subsequently analysed for recurring themes and used as an onset for developing participatory methods involving the families in the design of the PULSE Plaza exhibition and local activities. This took place in workshops and "fieldshops" (on-site workshops), employing a number of design games (Brandt, Messeter & Binder, 2008; Halse, 2008). The resulting mock-ups and prototypes were tested with families in workshops before they were finalised by the designers. The codesign process was split into two strands; one mainly involving the 'super-users' in exhibition design, and one building on the work with the Husum-area in the outreach and local activities development. The codesign process was documented with notes, video, audio recordings and photographs (for more details about the codesign process and methods, see Bønnelycke et al, 2018).

The PULSE Plaza Exhibition

The PULSE Plaza opened at Experimentarium in 2015. The aim of the exhibition is to encourage more physical activity in the everyday life, and give visitors a positive, social experience about health. To access the exhibits, visitors have to form a group of minimum 2 persons, and create a login that activates each exhibit. The exhibition consists of seven exhibits mimicking everyday environments, but with a playful twist. In the Balance Kitchen, visitors play 'the floor is lava' by climbing and balancing on the topsy-turvy interior, trying to touch lighting buttons on time. In the Fence Jump, the group gets an attempt at jumping as high as they can, view a video of their result, and get feedback on jumping techniques to reach higher, and then try again. In the Rodeo Lounge, one group member is seated on a chair turned into a rodeo-bull, and the other members pull robes to throw him/her off. The Energy Roller is a giant treadmill where you can 'buy' groceries in a virtual supermarket for the kJ you spend by walking the treadmill (to read about all the exhibits go to https://www.experimentarium.dk/udstillinger/puls-torvet/videnskaben-bag-puls-torvet/). The design is meant to inspire a creative and physically active re-appropriation of the home and its surroundings, creating a zone for playful experimenting and social interaction within the family. In the centre of the exhibition is the MidPoint, where the team can log in to view their achievements, take quizzes and select photos of their activities to receive on email. The PULSE staff has performed observations of the use of the exhibition, and it has furthermore been evaluated with interviews and questionnaires (Zachariassen & Magnussen, 2016).

15 The Pulse Plaza Exhibition (as it looked at the time of the fieldwork in 2014. It has later been revamped as Experimentarium was renovated and reopened)

The Xbus

The Xbus was a community nights-program running 2013-15, where residents from Husum were offered free visits to Experimentarium. Busses transported residents to the science centre, where they received free entry and a meal after closing hours, and could roam the exhibitions for a couple of hours before being returned by busses to Husum. During the evening, explainers performed scientific demonstrations, dissections and hands-on activities. The event was held 3 times between 2013 and 2015, each time with more than 100 participants. Many residents participated more than once. The event was advertised and arranged in collaboration with the local housing association that organised registration and accompanied the residents. During the evenings, researchers took photographs, performed observations, and offered participants the opportunity to be interviewed, if they were willing.

16 Xbus participants lining up to enter Experimentarium

Articulating Modes of Participation in PULSE: Position, methods and materials

In what follows, I analyse which modes of participation are enabled by these approaches for audience engagement performed in PULSE. In so doing, I draw from my fieldwork on the PULSE process, from ethnography in the neighbourhoods of the intended users, to the design process, and the final design products.

The development process in PULSE was research-based, and the methods of design and research were closely intertwined. The researchers – including the author – both partook in the development process and studied it. Therefore, empirical material from the fieldwork, codesign process and other participatory events, was subjected to analysis to serve *in* the project as part of the development process, and also analysed as part of the study *of* the project. As an STS-researcher participating in a development process, my engagement can thus be conceptualised as an 'intra-vention'; a form of performativity from within, with my analyses producing descriptions that perform the research objects (Elgaard Jensen, 2012; Jespersen, Petersen, Ren, & Sandberg, 2011; Law, 2004). My contribution to the process was thus a performance of a 'double' cultural analysis: Both analysing the empirical field and the circumstances for the production of this knowledge (Damsholt, 2011; Jespersen et al., 2011).

The process was documented by notes, videos and photos, and all process documents and materials were saved as data. Qualitative interviews were performed with project managers and management of Experimentarium regarding the process, goals, outcomes and challenges of the project, loosely structured by an interview guide (Hammersley & Atkinson, 2007; Spradley, 1979). Project managers were interviewed twice; half-way, and towards the end of the project. Interviews were recorded, transcribed verbatim, coded, and subjected to a thematic analysis (Clarke, 2003).

I describe different modes of participation enabled by the participatory events staged by the PULSE project. My description does not reflect a prescription of how the mode of participation for each setting ought to be, nor does it provide an exhaustive account of all possible modes of participation, but describes the predominant mode each setting tends to enable. They are, in reality, not so neatly delineated or homogenous, but rather can be considered different examples of possible variations of modes of participation.

Ethnography – From Overt to Modest Participation

The ethnographic fieldwork explored different practices of health with an emphasis on physical activity amongst the families. It also investigated the family relations and dynamics in the area of health, physical activity and family social/cultural events. The fieldwork provided insights into different ways of understanding and doing health and family life, and to explore use and significance of local places and existing activities and communities. The purpose of the ethnographic approach was to unfold different health practices and understandings of health by inviting participants to describe and articulate how they think about and practice their health. They thus participated as active co-producers of the knowledge that should provide the foundation for new learning designs. From a performative perspective, fieldwork and ethnographic descriptions co-produce the phenomena they study, and the flow of everyday practices are entangled with processes of meaning-making and representations of the everyday (Callon & Rabeharisoa, 2003; Pink, 2012). So, as families described how their everyday life was practiced; expressed aspirations, values and ideals, they also performed identity-work and specific representations of themselves and their families. The fieldwork created an opportunity to rehearse and enact particular identities, and imagine particular futures. The fieldwork thus

afforded a mode of participation that dabbled with possible futures and played with images and understandings of the good family life, good exercise, to investigate tensions and harmony between them, and how to reconcile them. Rather than being a method for representing target groups and describing social practices, ethnography was employed as a strategic, activist tool to "enact new entities and realities into being" (Jespersen et al., 2011,6).

In this connection, we employed tangible and visual methods to not only favour verbal representations, and to enable ways of showing rather than telling about everyday life and health. By gathering families around their dinner or sofa tables, in their own home, a collective mode of participation was prompted; one that enabled family dynamics to unfold in their home surroundings. Coming into the participants' homes brought us into their private domain, but in a version that was also carefully arranged to produce a certain representation of the everyday. With the ethnographers' visit, the participants became hosts that prepared the meeting and organised the physical setup of the session, arranging their own roles and positions in relation to each other, the home setting and the ethnographer, and thus – concretely and symbolically – set the stage for the participation. The photographs of everyday scenes that were carefully selected, the snacks that were served, the televisions that were, or were not, turned on during the interviews, or the pictograms that were selected to illustrate what the families did during their days, all made a combined performance of the everyday life.

Thus, although the interviewer brought instruments and methods, their specific deployment and effects were highly dependent on the premises for participation set by the participants. The interviewer might strive to impose a certain kind of participation, but did not always succeed, and had to adjust accordingly, rather than making the participants behave in a certain manner. It was a format that changed according to time, place and participants. It was a situated and very specific event, composed differently each time. The ethnographers (the author and Catharina Thiel Sandholdt, fellow PhD researcher in PULSE) approached the families with an expressed wish to learn from them, and the fieldwork created a mutual learning situation: The families became both teachers and learners; teaching the ethnologist about their own lives, creating their representations about it, but also in the process, achieving realisations about themselves, such as this father, looking at the family calendar from the interview exercise:

Interview excerpt, Family 1: Mother, Father, Son (12 y), Daughter (11 y), Daughter (6 y)

Father: What really gives me food for thought here is how little time we spend together on a daily basis. (…) Actually, on workdays we spend just as much time at work as we do together as a family. I mean, it's actually not very often that [Mother] and I [have time to] talk with each other.

17 One of the families conducting the calendar exercise

The ethnography created 'dialogic events' (Davies, 2014), where participants engaged with the topic of health, learning and the good family life, and discussing their ideals, wishes and possible solutions. Yet, as a distinct mode of participation, the ethnography and its required exercises posed particular demands on the participants: It required that they were willing to

reflect critically on their everyday health and family practices, and engage in discussions about the possibilities for change. It required a certain orchestration of the participants; gathering the families, making them make collective deliberations and take part in joint activities, following a certain sequence of methods. The mode of participation required visitors to be willing to open their doors and expose their private lives and challenges to the scrutiny of a stranger. The ethnography, as it was arranged in the project, thus required participants to already be attuned to a certain mode of self-representation and performance. Not all families, however, were able to meet these implicit requirements.

As the project progressed, the fieldwork bifurcated into two separate strands, caused by a need to adjust methods and approaches according to the two different target groups. Most of the participating families from Hellerup were upper/middleclass families with double incomes, higher educations and active lifestyles. They were all familiar with the science centre and visited frequently. Shortly after the advert was placed in the local newspaper, a large number of families had contacted the project, volunteering to participate. Without difficulty they performed the photo-exercise, and interviews were long and filled with detailed descriptions and reflections on existing health and family practices. This is illustrated with an excerpt from observations during a family interview:

> **Field notes, interview, Family 1:**
>
> The children are very eager to share their stories about what kinds of activities they attend. They are extremely articulate and participate with great enthusiasm. At a point, [Daughter, 6 y] wants to show us she can do cartwheels. She interrupts [Daughter, 11 y], and [Father] stops her, saying she isn't to disturb her sister while she's doing this. (…) The parents try to give all the children speaking time and to go through each's calendar in turn. The children reach up a hand when they want to say something, and wait until given permission to talk. They really are captured by the calendar exercise, and say they think it's a lot of fun. The whole family works focused and pretty efficiently on it, except from [Father], who wants to talk about his job [in a health promoting NGO], and therefore takes longer to fill out his. He talks about the importance of structural steps to prevent lifestyle diseases, such as smoking bans and more bicycle parking at the workplace. The family agrees that

> they would like to have more pictograms for the calendars that specify certain household activities (…). They draw some new ones to add to the predesigned ones.

Families in Hellerup easily engaged with the methods, understanding their purpose and often did more than required of them, e.g. made video clips and photo collages and took extra photographs to better show their everyday life and physical activity. Many expressed how they thought the project was 'interesting' and 'exciting'. They felt the project spoke to them, and identified with its call to participate. The mode of participation requires a range of basic skills and particular family dynamics which the Hellerup families embodied completely. The Hellerup families are the epitome of the participating subjects: Instantly and easily engaging, family members already knowing what to do and how; familiar with 'the rules of the game'; and how to behave to create a space of civil dialogue. They seemed to perform a kind of routinized participation; they had done this before, and most importantly, they liked it. They responded to the fun and passion as normative dimension inscribed into participation.

The same resonance and intensity of engagement with the ethnographic methods did not take place in Husum. Here no one responded when the project advert was posted. Recruitment instead took place through networking and snowballing, and the local associations assisted in making connections (Streeton, Cooke & Campbell, 2004). The families recruited in this stage were an ethnically and socially mixed group, with great variety in family constellations, language skills, and health practices. There was not the same instant recognition and identification with the project as in the Hellerup families. Many of the Husum participants were hesitant and insecure about whom the researcher was, the purpose of the project, and what kind of contributions the participants were to provide. This also stems from the fact that in recent years, a number of different projects have been initiated in order to address the social problems in the area. In interviews local project workers told that many residents have troubled relationship with authorities, and thus are sceptic towards any new public or project actors. They had trouble distinguishing between the different projects that invited them to participate in this and that. Furthermore, the interviews performed in Husum were sometimes impeded by language barriers, and the methods that had worked well with the Hellerup families posed difficulties in Husum, as for instance some were reluctant to be photographed (as they were wearing hijab) or – despite

assurances of anonymity – were afraid the photos would be published. Some were afraid that information about private matters would be leaked to the authorities. The ethnographer (in Husum, only the author performed the fieldwork), therefore, had to adjust form and content according to each family's situation and the interview context. Most interviews were far looser structured than the first stage, with questions and subjects being more concrete and centring on existing practices. This is illustrated with an excerpt from interview field notes with a Husum-family, where the family have misunderstood the setup of the situation, and severe communication difficulties hamper the interview session:

> **Field notes, interview Family 2; Mother, Father, Daughter (11y), Daughter (7y), Son (6y):**
>
> When I arrive, only the parents are home. I had feared that would be the case, when [Father] suggested a morning on a school day; that they hadn't understood the interview was to involve the whole family. They have prepared coffee and a load of sweets at the coffee table, and are surprised that it is only me; they had thought there would be more of us. They speak with a heavy accent, and often switch to Kurdish, as [Father] has to interpret to [Mother] often, since she isn't confident in Danish. It complicates the interview, and it's very hard to get a conversation going. I get unsure about how much they understand of what I am saying, I try to slow it down and simplify my language. The conversation doesn't flow; there are long pauses, with very brief answers, and I quickly ditch the idea of asking complex questions. [Mother] is very reticent, and when she does talk, it is very quiet and mumbling, and often directed at [Father] who then repeats or translates to me. (…) During the interview, [Father] asks me if we can arrange other excursions than to Experimentarium; they'd rather go somewhere else. He also asks me whether we have some health programmes for his son; they are worried he's getting a bit overweight. They don't think he moves enough, [Father] says. I try to tell them a bit about [Local health centre] and the housing association and the programmes they have, but they've never heard of the health centre, and they don't quite understand that I am not from the housing association.

In this interview session a number of problematics regarding our implicit assumptions about skills and knowledge of the participations were uncovered. The idea of a research interview in itself was unfamiliar to the family, and at first they thought they were to be on television. An awkwardly formal setup and the lavish arrangement indicated that they had no preconceptions about what to expect from the interviewer, and a sense of tension reflected insecurity about what they were to deliver, and to what end. The field note excerpt makes clear, that the interview session and the conversation as a form of participation build on requirements that the Husum-families could not fulfil. The basic conditions of speaking the same language, being able to articulate complex relations and circumstances, and having some knowledge about the principles of interviews or participatory development were not in place. The fundamental principle of the participants being co-producers and considered a creative resource and partner in the project was completely misplaced in this setting. Their possibilities for co-creation and participation were hampered by the requirements of the ethnographic approach. In opposition to most of the families in Husum, they were, in fact, willing to participate, despite their insecurities about who, what, how and why, but the setup was not able to accommodate them.

From this and the other interviews with the Husum residents, themes around crime, feelings of unsafety, isolation and distrust took precedence over the intended themes of health, physical activity and family life. The intended topics were less prevalent for the participants, partially explaining the lack of motivation to participate. When the participants did talk about health and physical activity, it was often in frustrated or helpless terms; asking for help, expressing insecurities or regretting lack of opportunity or resources. They did not conceive of themselves as competent or knowledgeable enough to contribute, but rather expected that this was something professionals should help them with. This pointed to other barriers for promoting participation; that both health and participation were conceived and practiced differently in Husum. The competence and position to promote health was rather understood as something possessed by the professionals, not a matter of individual responsibility or possibility, which, in this perspective, rendered the notion of citizen participation meaningless.

To further investigate the challenges of facilitating participation in the area and how to create an inclusive learning experience for the residents, the fieldwork was expanded to include a number of local actors and projects. This brought me to other participatory events that more

directly aimed at addressing the social challenges in Husum: For instance, a workshop held by the municipal area renewal secretariat to generate ideas for renewing the green areas to make them feel safer, more welcoming and address issues of trash disposal, sustainability and vandalism.

> **Field notes excerpt, vision meeting in Husum:**
>
> There are a number of critical questions from those in attendance, especially around the lack of tenant's participation. One remarks that it is always the same small group of around ten persons who participate, despite there being more than a thousand residents. People express concerns about the challenge of completing projects and reaching decisions without proper voter turnout at assemblies. One participant asks whether decisions can be forced through without the sufficient attendance, but [head of secretariat] declines this. There is continuous talk about the lack of engagement and participation, and participants are very agitated. (…) Some express frustration over spending time and energy on working on these long-term-projects, when most residents have no vision whatsoever, and nobody wants to take care of things for the future generations. One exclaims angrily, that nobody cares about anything but their own…

The excerpt reflects the 'classic' mode of civic participation, where stakeholders and citizens attend dialogic events and formalised decision-making process regarding communal initiatives. The format of hearings, workshops, consultancy, and so forth, are classic modes of participating and involving citizens. This format, however relevant the content for the Husum residents, afforded a mode of participation that did not resonate with but a few, as apparent by the meagre turnout at not only this, but every similar event, as my municipal informants recounted resignedly. Not participating in these opportunities for enacting citizenship and be empowered marginalized the residents even more and made them appear disinterested in community affairs, resulting in them being cast as short-sighted and lacking solidarity. However, employing other methods to approach the residents opened up to other ways of understanding how participation can be performed in community-oriented, caring and non-discursive ways.

Through interviews with a number of local project staff and the few residents who were willing, along with observations of local events, it became apparent, that there was a number of local actors who were engaged with arranging excursions and events for the residents; men and women who volunteered as sports instructors, interpreted for others in dealings with the authorities or municipality, served as mediators between residents in disputes, and functioned as role models for youths with troubled parents. Most of this community carework, however, took place under informal conditions and was network-based rather than working through official channels. These were practices of performing responsibility and community that were subtle and unarticulated, ad hoc and unofficial, and thus was invisible work from the viewpoint of conspicuous democracy and participation.

How does one create participatory approaches that cater to this modest mode of participating and communicating? As the ethnography demonstrated, solely doting on the discursively focused and 'standard' framework for creating dialogic events did not achieve much in terms of unfolding the caring community practices and interactions that were quietly performed in Husum. Being more heedful to the circuitous ways of participating in community matters and engaging with local health and wellbeing proved more fruitful than asking residents if they wanted to help us design an exhibition. The ethnographic approach was adjustable to enable different modes of participation, and when necessary could downplay the discursive to let other means of expression come through. The fieldwork thus afforded different versions of participation: There were situations of more direct participation, where families and PULSE project staff met at a designated time and space to discuss, enact and engage in mutual learning processes. There were also situations where participation was performed subtly and modestly, not articulated as a contribution to a health promoting exhibition design process, or even recognized as having to do with the science centre. As an attempt to facilitate participation, the ethnographic approach provided a flexible framework that afforded different modes of participation and thus was, to a certain extent, able to include underserved users and their perspectives. As such, it did enable the identification of challenges to participation, if not to fully solve them.

Codesign – Formalised Participation

The codesign process, the second approach to participation employed in PULSE, consisted of a series of workshops and tests of ideas, concepts, mock-ups and prototypes. Through various activities, visitors were tasked with providing input to a specific design stage, based on the use of different design games (see also Bønnelycke et al, 2018). By codesigning a health promoting exhibition, the visitors participated in defining healthy practices and in creating the frames of public debate and dissemination on the issue of health and physical activity. The codesign process in PULSE in a way built on a quite conventional approach to performing participation: Making relevant stakeholders meet and discuss issues and come up with ideas to address them. The codesign approach can be construed as a 'classic' dialogical event (Davies et al., 2009), consisting of deliberation, negotiation and argumentation. This kind of design process is often structured as a series of rehearsals and enactments that build upon each other in a sequential progression that encourages participants to follow a scheduled series of steps towards a possible future.

Accordingly, the visitors' participation in the design process of PULSE was highly choreographed and timed according to the codesign manual, which prescribed minute by minute activities, methods, and expected outputs. During the events, designers and researchers from PULSE acted as facilitators and steered the dialogue in certain directions and kept time, closing down discussions and deciding when the next stage of the process was to be set in motion. Through such management, the participants were at once free to provide as many creative inputs as they could conceive of, and heavily managed and directed, making the codesign events ambivalent spaces of orchestrated and facilitated creativity

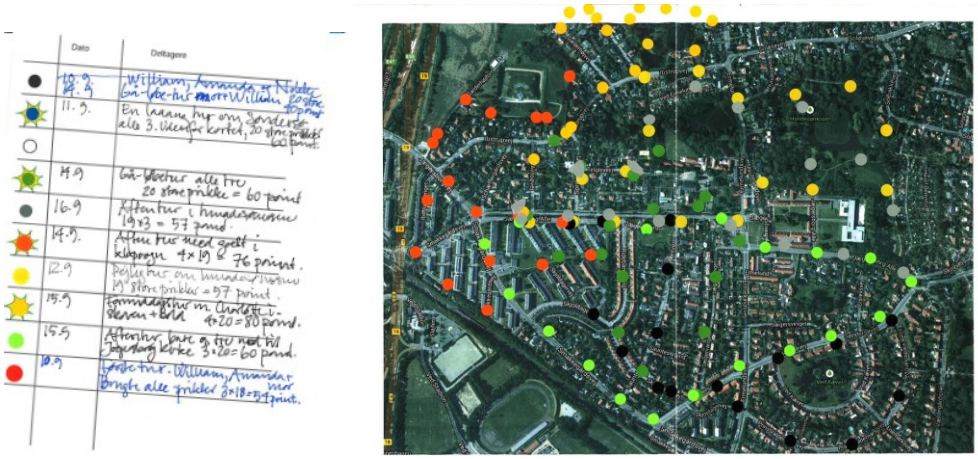
18 Design workshop: Staging visits and building ideas

The codesign process afforded a mode of participation that required a range of skills and competences of the participants. In sessions of LEGO-building, theatre performances and prioritising games, the codesign process required certain language and creative skills, working with challenges and being able to suggest creative solutions. With questions like "What would it take to make Mom more active?", the methods also required the participants to express their health challenges and needs, reflect on their health practices, and expose their everyday lives, routines and vulnerabilities to the scrutiny of outsiders. In addition, the codesign process required participants to acknowledge that they needed help to improve their health and to be confident enough to believe they could contribute to the process. Further, the participants were expected to be able to make connections between the design exercises and models and their everyday experience and challenges, and envisage how the putting into practice of these 'rehearsed futures' (Halse, Brandt, Clark, & Binder, 2010) could affect them and their experience of the finished design.

Through a focus on mitigating the 'threat' of sedentary lifestyles, the codesign events encouraged the participants to contribute to the solution of an individual as well as a societal problem as indicated by the wording of the advert calling for participants: "Would you like to help making Hellerup more healthy?" With this invitation, the participants were configured as democratic, responsible citizens. The advert addressed those who were familiar with the museum institution, and accustomed to museum-based modes of participating, debating, and enacting citizenship. Despite the use of material approaches and the inclusion of props and prompts to make the participation less discursively oriented, the codesign approach primarily hinged on a model of reflective, considered argument, privileging those citizens adept in such interactional techniques (Davies, 2014, 97). While built on an idea of collaboration, co-production and collectivity, the codesign process also emphasised differences and exposed weaknesses and insecurities amongst those less used to the participatory formats. This spurred frustrations and uncomfortable situations, where some participants felt pressured into unwanted positions of responsibility, and that they were made to feel guilty or inadequate (Bønnelycke et al., 2018). The challenges of using this approach to facilitate inclusion in PULSE became apparent, when applying the same design-exercise to different families. In the following example, the family

from Hellerup easily engaged with the participatory methods, whereas the Husum-family struggled to fulfil the requirements for participating:

> **Interview excerpt, PULSE project manager:** So there was this family from Gentofte, who just walked a lot – they walked every day, and made their own, bigger [mock-up] map, and they used ALL the dots [to mark the largest possible territory]; they kind of thought they ought to use them all, or they wouldn't have sufficed, or something. There were so driven by the fact that we'd ask them to do it. And the mother talked so much about health, and how much or how little the kids exercised, and on and on. And then… [laughs wryly] we were at this Husum-family, where just conducting an interview was quite the challenge, because, well.. There were 5 kids, and they went in and out, and the doorbell kept ringing, because they were going up and down to play, and uhm… The mom went back and forth, because she had all sorts of things to do, and… they were really nice, and really wanted to try and test the Pocket Dog, but the entire setup around the analogue test model, it was simply more than they could handle. I remember, like – well, at least they were great at taking pictures! [Frustrated laugh] They'd taken tons of pictures. (…) But the thing with using the map, and putting on the dots and such, that was a bit, ahhh… It wasn't quite… Well, they kind of participated in a different way.



31 Testing an analogue mock-up of an app that registered walks in the neighbourhood. On top: The Husum family had difficulties but took a few walks. Bottom: The Hellerup family that made their own, extra large map, and brought guests to join in a competitive game about walking the most (Poulsen, Siquir & Nørgaard, 2013).

In the interview excerpt, stating that the way the Husum-residents participated was 'different', the project manager expresses that their way of participating, albeit eager, was a less orderly and disciplined way of participating that did not meet the expectations and demands of the set-up. They did participate, however, not in the 'proper' or preferable manner. The codesign setup enacts participating subjects that are orderly, responsive and follow instructions. It also produces an ideal family organization, where everyone sits quietly down at the same time, parents are able to delegate and monitor the tasks at hand, and which prioritizes this design commitment over, for instance going down to play. But the codesign setup has a hard time accommodating chaotic and unruly families. However, perhaps it is not the participants who should conform to the participatory approach, but the other way around? The fact that the underserved users 'participated in a different way' as the PULSE manager described, points to the necessity of working with a range of participatory strategies. The positive response from the Hellerup-families and their ease in applying the methods in contrast with the difficulties in Husum suggests that the codesign afforded a mode of participation that was well matched with the pre-existing audience, however less purposeful when it came to attracting and engaging the non-users. If this chaotic situation reflects the everyday lives and practices of the families, then maybe this is an important insight in itself that we need to take serious as an empirical challenge, as well as a methodological one. The family was, in fact, through their struggles with completing the task and participating in the interview session, conveying important knowledge about their everyday life and challenges. Rather than participating through formal discussion, they enacted

their participation through collective practice; striving, not succeeding, in doing the required tasks, which actually tells just as much as the neatly placed dots and notes of the Hellerup family. It might, admittedly, be a bit harder to translate, and thus requires more work from the other co-design partners. Input becomes less clear and direct to the design process, but no less important. Participation thus takes another shape, with another power balance, and different and unequal tasks for different parties. Thus participation and the 'co' in codesign require different setups and different requirements of different users, sometimes recognizing that unequal modes of participating are the most equitable.

The PULSE Plaza exhibition – Bodily Participation

The PULSE Plaza affords a mode of participation based on bodily activity, social interaction and play. Visiting the exhibition is (presumably) voluntary and initiated by the visitors who have chosen to come to the science centre. Its aim is to connect exhibition and bodies in an experience that provides positive associations with physical activity, and encourages the visitors to increase their pulse by performing activities in the different exhibits. The PULSE Plaza affords a social mode of participation, as multiple users united as a team are required to use the exhibits. The exhibits have minimal factual information, thereby foregrounding the bodily experience. Through the hacking[18] of familiar environments, the PULSE Plaza encourages a mode of visiting that mimics the interactions and social dynamics of the home. It is an exhibit aspiring to establish links to the everyday environment, wanting to be carried into the everyday life, at the same time as drawing in and translating everyday practices to the exhibition environment, so that disco-dancing in the bathroom suddenly becomes a science centre mode of engagement. The exhibition emphasises fun and a social experience. It aims to elicit laughs, to experience health and learning as something fun and social. It draws on existing family dynamics and roles, challenging them in a gentle way.

[18] Referring to the appropriation and modification of existing products or design to another purpose, a recent trend in everyday design use, conceived as a positive and creative addition of value to 'standard' products, e.g. IKEA furniture.

However, under the 'fun' element lies a more serious/normative learning agenda concerning the health benefits of physical activity, and attaining physical activity as a social, family-oriented practice. To direct the visitors towards this learning outcome, some instructions are provided as to proper use of the exhibits, and specific roles are assigned team members, just as they are expected to collaborate in a team effort to either gather points or jump, bike or dance together. The exhibition thus in a playful way choreographs participants in a very specific, bodily manner. Through the floor design the exhibition aims to nudge the visitors to frequent the centre exhibit (the MidPoint) with the factual health information between using each of the surrounding exhibits that are based on physical activity in different forms. This is intended to create a cyclical pattern of use, where visitors in between visiting the exhibits that get the pulse racing, return to the centre to receive feedback, complementing the bodily experience with a space for reflection, dialogue and the acquirement of factual knowledge about physical activity. However, the visitors can opt not to follow it, since they are only required to use the MidPoint for registration, and can use all the other exhibits without returning to the MidPoint. In fact, most of the visitors observed were skipping the reflection in the MidPoint, and only used some of the exhibits, or used favourite exhibits repeatedly, thus resisting the script for the exhibition.

The overall purpose of the PULSE Plaza is to encourage the visitors to do similar hacking of their home environments and to create awareness of the possibilities and the positive effects of being more physically active in the everyday. For instance, the Rodeo Living Room implicitly encouraged visitors to be less sedentary and spend less time in front of a screen and to collectively support each other to be more active. The Energy Roller directs attention towards the 'cost' in kJ of different food items, by making you 'earn kJ' through walking the wheel. Since PULSE aims to promote physical activity, it connects to the societal concern of preventing non-communicable ('lifestyle') diseases. As such, PULSE is inscribed into one of the 'big concerns' of western societies; and the exhibition can be seen as a series of translations that transport and scale down a global challenge to connect to everyday situations and bodies of the particular visitors that come to Experimentarium. The PULSE Plaza affords a form of participation that is based on mundane actions and performances and mediated through engaging devices that turn the attention towards public matters, while supporting a particular notion of healthy living and lifestyle. By engaging each visitor in health promoting activities through the exhibits, the PULSE

Plaza aspires to address a societal problem, one increased pulse at a time. The PULSE Plaza thus turns 'everyday practices into occasions for acting on public affairs', presenting suggestions as how to make health promotion doable, and participation easy (Marres, 2012, 132).

Being so adaptable to different competences and broadly accessible, the PULSE Plaza thus provides an opportunity for those less accustomed to museums to easily engage with the exhibition. It does provide more appeal for the underserved users than the more scientific content-heavy exhibitions: When a number of Husum-families visited Experimentarium at the Xbus community event (see below), the PULSE Plaza was one of the more popular exhibitions. However, the PULSE Plaza also contains embedded normativities regarding how to perform health, family activities and participation: In the PULSE Plaza, health is associated with certain values: co-operation, vitality, playfulness and fun. It presupposes that visitors are willing to accept this premise; that health should be enjoyable and social, and something to put on display. Visitors have to be willing to let go of inhibitions and jump, dance, sweat, risk falling and looking ridiculous. There is an element of exposure and public performance that demands that you feel confident and secure enough to do this. This is not necessarily the case for everyone, especially not underserved groups, who might not always know what to expect or what is expected (Dawson, 2012).

In an interview, one project manager expresses the problem of attracting and appealing to the underserved users:

> **Interview excerpt, PULSE project manager:**
>
> It isn't enough just to develop something with people and say "This is for you", if they can't come and see it (…) We want to make an exhibition where these socio-economically challenged families can feel at home and feel that it's something for them. But to do that and then calling it inclusion – I get it, you can't. It's an attempt. It's a step in the right direction, but it's not there yet. We have to make them bloody come.

Here, the project manager articulates some specific ideals for how a museum should be experienced, expressing that the underserved users should 'feel at home', and feel like it is something for them. This is in stark contrast with some of the active endeavours of the

participatory agenda of PULSE to shape, steer and configure the participants in specific directions that are distant from their usual practices and social dynamics. Furthermore, as the project manager expresses, to access the exhibition, nonetheless, audiences need to come to the science centre. In other words; the exhibition still presumes a pre-existing audience group. This points to the central paradox of the inclusive efforts of PULSE: People have to come to the science centre to feel included, which presupposes a sense of connection and relevance. They have to feel that it appeals in order to make the effort of getting there and have that sense of belonging confirmed. Thus, the crux of PULSE, and, perhaps, participation in more general terms: Without a fundamental, pre-existing participatory disposition, the participatory approach fails. It does not grow from nothing.

Xbus – Chaotic, Spontaneous, and Communal Participation

To bring the underserved users into the science centre, the Xbus was introduced. The only explicitly formulated purpose of the Xbus was to provide the Husum residents with a chance to visit the science centre. Upon arrival, visitors were free to roam the exhibitions, look at and try what they stumble upon, in a spontaneous, unchoreographed manner. The relative unscriptedness of the way that people arriving with the Xbus participated, however, also created confusion and friction, as implicit expectations and normativities regarding the proper behaviour of visitors encountered different kinds of behaviour than expected. This is evident in the following quote, in which one of the PULSE staff describes one episode from the third Xbus event:

Interview excerpt, PULSE project manager

> And then they just acted so WEIRDLY. From the moment they entered. I mean, it was CHAOS. (…) In their way of talking to each other, and you know, some of these kids were really leaders and went around like [shows a hardball-attitude], you know, bossing the others around and… (…) Well, it was like Experimentarium was just any place. Before [at previous Xbus-events] we kind of experienced that we were a place that could be social, which we thought was cool; that they got together and had a good time. But still it seemed like they also liked what Experimentarium had to offer, that it was interesting to them, you know? (…) That they used Experimentarium the way it wants to be used. And most of these

> people didn't. Some had fun, but they seemed TOTALLY – simply out of place. (…)It just didn't seem like it was for them.

As this quote illustrates, the project built upon a pre-existing script about who the users were, how they should act, and how Experimentarium 'wants to be used'. The modes of participation that the Xbus afforded, however, went far beyond the implied singular script of participation. Loud performances of 'laddishness' (Archer et al., 2016) and cocky behaviour however, were not considered appropriate modes of participation by the staff. These performances, or ways of participating, used the science centre as a backdrop for laddish enactments of status and competition. This mode of participation was hard to accept for the museum staff, because it did not conform to expectations and 'proper' museum behaviour (see also Dawson, 2012). In this quote, the underserved users' form of participation is not just 'different'; it is 'out of place', 'weird' and 'chaotic'. From the perception of participation as formalised and disciplined, this behaviour is not recognised as a form of participation, but can only be perceived as disruptive and cocky. The behaviour is un-envisaged, unsolicited, and is thus not visible as a mode of participation: As one that challenged the norms for behaviour and social roles and appropriated the science centre for other purposes.

It seems that the participatory event not only afforded different modes of participation, but also produced different kinds of non-users and exclusion; those whose behaviour is not optimal; 'different', but well-intended, accompanied by interest and the willingness to try, and those, whose behaviour and attitude is not appreciated and problematic. Apparently, participation is also constituted as a state of mind, and an attitude: Interest, openness, perhaps even gratitude to be allowed and enabled to participate. So participation is not only to be performed in the right way, it is also supposed to be done in the right state of mind.

Other, less controversial, modes of participation also unfolded at the Xbus events. During the evening, explainers performed live dissections of calf hearts and brains, explaining and demonstrating their composition and function. The audience could join as they wanted; watch, prod and ask questions, and the explainers would adapt the content and form accordingly. These demonstrations spurred fascination, revulsion, and attracted small crowds. On these evenings, the exhibition halls were buzzing and busy, but the demonstration stations provided small islands of

quiet concentration. Here, explainers, visitors and objects such as brains, hearts, knifes and fluids assembled to perform a mode of participation that was subtly and finely attuned to the here-and now interests and levels of understanding of the users. The immediate and unfiltered feedback from the onlookers (such as exclaims, grimaces, curious fingers stretched to touch) prompted the explainers in the directions most interesting to the visitors. The demonstrations afforded a mode of participation that was spontaneous, immediate, loosely scripted and accessible for all. Several participants afterwards described fascination and interest, and that the dissections captured them more than anything else.

32 Dissection at Xbus

The exhibitions at Experimentarium are highly hands-on, and sometimes full-body engagement activities. Some are more sedentary and technical, requiring more instructions, time and concentration. The most popular exhibitions at Xbus were those that required minimum description and afforded the most sensory/bodily engagement, such as the PULSE exhibition, Winter Sports (with exhibits enabling visitors to try disciplines such as skiing, ice skating and curling) and the Brain, featuring a CT-scanner and a number of exhibits to confuse and stimulate the brain. The modes of participating that unfolded were primarily social, loosely structured,

dominated by strolling around, trying exhibits for a little while, and then moving on, as described in the observations from one of the events:

> **Excerpts from observation notes, Xbus 2**
>
> Nobody reads the texts by the exhibits. People stay briefly at each exhibit, then move on to try something else. An elderly woman sits on a bench in a quiet corner. On the bench across from her a young woman is deeply immersed in her phone. (…) The east European couple are trying things while their children run around on their own. Several other kids are running around in groups without their adults. By the cafeteria several mothers are sitting, without their children, looking at their phones.

These modes of participation was not so much centred on scientific learning, as being sociable, communal experiences. Some did not even try exhibits. Around the science centre, adults placed themselves on benches and chairs, watching others playing, talking with neighbours and friends. Mothers often seated themselves in the cafeteria, where they were visible to their children, as they explored the exhibitions and demonstrations. The cafeteria took on a distinct quality of a plaza, where the Husum residents met, chatted and snacked.

33 Socializing at Xbus

In subsequent interviews and vox-pops, many participants specifically highlighted the social quality of the event, and the strengthening of community relations as a benefit. They emphasised that they had met neighbours they had not talked to before, and that new acquaintances were made.

> **Interview excerpt, Xbus participant; young woman:**
>
> … all the residents meet and get to know each other. It actually gives a form of, um, respect, in a way. Positive respect, when seeing each other afterwards. And maybe months or years later. Where you recognise each other. And that's why I believe you have to be there together. It should be fun, too, you shouldn't be steered around, having to do this or that – no, it has to be fun, people feeling that they are there on their own. That it's fun being there, you're not forced, and you have self-determination…

In the fieldwork in the Husum area, many residents had lamented the lack of interaction between residents. The Xbus provided opportunities for the community to meet in new ways, to actually experience a sense of community rather than just being residents in the same neighbourhood. The Xbus afforded community-oriented modes of participation, where the science learning environment became more of a backdrop for performances of community dynamics and social experiences. The bus rides, the communal meal, the involvement of the local housing association and the coordinated common activities all contributed to foreground the community experience; a communal mode of participating. A pattern of visiting was established that combined stages of uncoordinated 'free time' with scripted activities; i.e. the communal meal and the bus transport with the obligatory registration on the participants list, being seated in the bus, waiting for latecomers, and receiving communal messages. These ways of handling and addressing the visitors as a party on excursion performed them as a group. In that way, the Xbus did not just transport 'the Husum community'; it transformed the residents into a community that was performed in a certain way, and enabled specific performances of participation and museum-use by the visitors at the same time.

The symbolic and material framing of the Xbus as a community event created a space for local dynamics and social performances to unfold on the Experimentarium ground, making it a scene for the enactment of community, family, parenthood, social and cultural values. For instance, at meal-time during one of the Xbus events, the PULSE and Experimentarium staff were quickly joined by a handful of visitors; women and teenage girls, who helped serving food and cleaning up afterwards. It was a recurring pattern that some of the families without

encouragement volunteered in managing the practical tasks of the event; assisting in getting messages through, leading people in and out of the science centre and to the busses, cleaning, serving, and generally working towards helping the staff and ensuring that everybody had a good time.

The Xbus afforded alternative modes of participation than the more straightforward, deliberate, intentional dialogue that favours discursive engagement. This mode of participation allowed the participants to perform the science centre in their own way, through their use, rather than through deliberation. The Xbus enabled dialogue in the shape of performances of community, family and friendship, and through collaboration on serving a meal, joining a crowd of onlookers, greeting a neighbour. It was a space where participants felt safe, amongst neighbours, not divergent or a minority. This enabled performances of responsibility and role modelling, as well as protests against norms and expectations to take place. Additionally, it enabled a mutual learning situation, of getting to know each other, both residents and staff. Most importantly, it made the participants feel welcome and that it was something for them:

> **Interview excerpt, Xbus-participant; Father, 40:**
>
> It is lovely to see so many people who really want to, like, do something for the residents, I think it's really great! And maybe the residents have a hard time...showing it – but believe me, they're all happy!

There were numerous expressions of gratitude and amazement that 'it was all just for them'. By inviting the residents in, just to be there, getting to know each other, connections, trust and personal dialogue was enabled. Content and learning were adjustable to the immediate responses and needs of the visitors. The families were able to show, rather than tell, through their chaotic and informal participation, how and under which conditions it could be possible to engage – with a science centre exhibition, with community change, or with issues of health. It created a learning space where individuals were not singled out to perform a creative task or argue for a standpoint. In afforded an opportunity for the community to hack the science centre and use it in their own ways; noisy, chaotic and informal. The Xbus also afforded specific social relations – between the visitors, and between the visitors and the staff. The much sought after 'co'-relation that was expected to be established in the codesign process, appeared in the informal meeting

between participants and staff at the Xbus, particularly in the communal meal, where participants spontaneously and voluntarily positioned themselves besides the staff in the serving of the meal – sometimes even serving to the staff, thus swapping positions and taking an equal stance.

In the area renewal workshop in Husum, those not appealed by the deliberative format were dismissed as disinterested or without sense of responsibility and community – of not caring. But the experiences from the Xbusses show differently; there were numerous performances of care, responsibility, cherishing of the community and feeling safe and togetherness, but these performances were not compatible with prevalent formats of participation. The setting that the science centre provided afforded embodied, emotional, community-oriented modes of participation. However, these were modes of participation that did not match pre-existing frameworks or criteria for participation. The struggles of the staff with accepting and translating the experiences into something useful for the project point to a mismatch between intentions, methods and the everyday life and subjectivities of the underserved users. That participation did not come in the right forms, at the right times and places, but instead emerged in messy and chaotic ways, points to the need to adapt notions of participation, rather than forcing pre-defined formats and outcomes unto new audience groups. To shed preconceptions about how the target groups should act, how participation should occur, and instead embrace an erratic course in pursuit of participation, scrutinizing the emerging dynamics and relations for signs of different modes of participation.

34 Xbus participants

Conclusion: Rethinking participation through ethnography

With the participatory turn, science centres and museums are positioned as settings for the performance of democratic citizenship and participation. The participatory paradigm prescribes ways of communicating, interacting and collaborating around knowledge production that pose certain normative requirements on participants: The ideal participant is articulate, confident and willing and able to join a discussion on socio-scientific issues. The participatory paradigm, in other words, aims to empower individuals by encouraging them to act out citizenship through controlled and calm deliberation. The participatory events and formats, however, can have adverse effects of exclusion. These mechanisms need to be explored, to better facilitate inclusion, and design approaches to accommodate the differences of audience groups.

This article suggests an analytical approach to conceptualise how the learning institution as a participatory setting enables specific relations, positions and subjectivities. With the introduction of the analytical approach that views participatory events as affording specific modes of participation, the article points to mechanisms of inclusion and exclusion inherent in how participation is socio-materially produced. Demonstrating that efforts of promoting participation can have excluding effects, I argue that it is necessary to keep an eye on the mechanisms of exclusion afforded by any kind of approach. Doting on formalised participatory formats entails the risk of neglecting other potential modes of participation, such as sharing an informal meal, joining in a mundane task, or showing care and consideration through family and community practices.

With this approach, I have analysed the methods taken to facilitate participation in PULSE, a science centre-based project with the intention of promoting health and inclusion, through participation. I have identified four different modes of participation afforded by the different participatory events that were staged in the context of PULSE: Firstly, the *modest participation* afforded by the ethnographic fieldwork, which was adjustable according to needs and situation; Secondly, the *formalised* workshop-format participation of the codesign process, which is often assumed to be *the* approach for facilitating democratic participation and citizenship. In practice, however, it is a highly scripted and choreographed method that in this case had unintended excluding effects. And thirdly, the *bodily participation* afforded by the exhibition format, which

enabled participation through playful, bodily engagement. Finally, I described the *chaotic participation* of the Xbus, which through its unscriptedness afforded social, community-oriented and easily accessible modes of engaging and learning at the science centre.

I have examined how the configuration of participation in the PULSE approaches serve as means to promote inclusion, pointing to discrepancies between the means, and the intentions behind them: That what was expected or articulated as desired outcomes and ways of performing participation, did not occur, but other forms and possibilities emerged instead. These possibilities were non recognizable or valued from the perspective of the classic mode of conceptualising and formatting participation, and by widening the gaze, I enabled the recognition of other modes of performing participation, that were less formalized, conspicuous and smooth. Instead they built on the social dynamics and everyday performances of community and family life.

The envisaged modes of participation in PULSE, reflecting the dominant discourses on participation, corresponded well with the visitors that were accustomed to the science centre and familiar with an overt and deliberate version of participation. The skills and knowledge required to deliberate, perform formalised creativity, and present their family life in a certain manner, were routinely employed by the Hellerup families, but not familiar to the Husum families. These underserved users performed health, community and family life in much more disorderly and unarticulated ways compared to the disciplined and articulated practices of the 'super-users'.

Instead, participation took unanticipated shapes. The Xbus had the unexpected effect of providing a reconfiguration of the everyday, by accommodating community-performing activities, providing a different framework that spurred new relations, social dynamics and subjectivities. It delivered some of the outcomes that had been expected of the ethnography and the codesign-process: Establishing personal contact with residents, people volunteering for interviews and home visits, and insights into learning dynamics and preferences of the target groups. The communal meal and the demonstrations enabled the settling down of chaotic families, providing islands of stillness and concentration that were hard to come by in home interviews. Thus in the participatory events, relations between means and ends were shuffled in surprising ways: The intended ends of one event were actually achieved by means of another.

The ethnographic gaze provides an entry for clarifying this, for qualifying the relations between means and ends in a participatory museum practice.

Thus the experiences from PULSE point to the potentials in the ethnographic approach as means to facilitate participation. The ethnography was a useful approach for understanding the complexities and situated enactments of participation in the everyday community settings and family life of the participants. The ethnography made it particularly clear that adaptation to the immediate needs and skills of the participants is crucial and that an explorative and open-ended approach can pave the way for developing customised and situation-specific modes of participation for underserved users. In the project, the ethnographic approach afforded participation, as well as enable the identification and analysis of other modes of participation. Importantly, the approach enabled the identification of modes of participation that were not recognizable or even visible within the dominant discourse of participation.

However, translating insights into exhibition design was fraught with difficulties in the PULSE project. Although inclusive, the drawbacks of the openness and the unpredictability of non-formalised participation are the fuzziness and complexity of the experiences. Such an open-ended process can be challenging, time-consuming and costly. Outcomes that are not predefined, and processes that cannot be planned ahead, challenge existing work structures and management forms.

Striving to include underserved users entails entering unknown waters, where outcomes are unpredictable. New methods are required alongside new perspectives to conceptualize and valuate the outcomes. Ethnography as method for both development and evaluation can contribute to this widening of perspectives, to better understand the relations between expectations and outcomes, means and ends. This can inform future design of participatory events that afford a wider array of modes of engagement than the standardized formats, and serve as ways of translating practices of non-participation into potentials for participation on other terms.

This article demonstrates how different participatory science centre-based events afford different modes of participation, accompanied by mechanisms of inclusion and inclusion, the articulation of desirable museum visitor subjectivities, and the performance of different social roles and

relations. In the pursuit of inclusion and equity, shedding light on these processes is an important task. The ethnographic approach can be mobilized to identify modes of participation, the requirements and restriction they pose on the participants, and their intended and unintended effects. This is important knowledge in terms of working towards increasing the inclusion of underserved groups.

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Article 3: Codesigning Health Promotion at the Science Centre: Distributing Expertise and granting Modes of Participation

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Julie Bønnelycke

Steno Diabetes Center Copenhagen, Niels Steensens Vej 4-6, DK-2820 Gentofte, Denmark and Copenhagen Center for Health Research in the Humanities, Saxo Institute, University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S

Catharina Thiel Sandholdt
Experimentarium, Tuborg Havnevej 7, 2700 Hellerup, Denmark
and Department of Science Education, Copenhagen University, Øster Voldgade 3, DK-1350 Copenhagen K, Denmark

Astrid Pernille Jespersen

Copenhagen Center for Health Research in the Humanities, Saxo Institute , University of Copenhagen, Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark

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Co-designing health promotion at a science centre: Distributing expertise and granting modes of participation

Museums and science centres are increasingly employing participatory approaches to exhibition design. Despite the increasing interest, the dynamics, challenges and benefits of employing participatory methods in museum design remain under-researched. Ensuring that audiences are involved requires reflections on the aim of the participation, and on the implications of its practical and institutional embeddedness. We analyse how co-design frames the meeting between disciplinary fields, as well as achieving audience involvement, through the case of the PULSE project[19]. Here, designers, researchers, and families co-designed a health-promoting exhibition at a Danish science centre. We investigate how the co-design process was shaped between the fields of health promotion research and exhibition design practice. We describe how audiences and professionals were redefined and repositioned, and how tensions arose and necessitated negotiations of expertise, authority and modes of participation. The ideal of visitor involvement created tensions with existing design and development practices complicating the translation of user experience into exhibition design.

Keywords: Co-design, ethnography, expertise, health promotion, participation, science centre

Co-design at the Science Centre

Recent years have seen an increased interest from museums and science centres[20] in contributing to promotion of health and wellbeing (Camic and Chatterjee, 2013; Chatterjee and Noble, 2013; Christensen, Bønnelycke, Mygind, and Bentsen, 2016). With this new engagement, science centres venture into the field of health promotion, with different challenges, methods and goals from habitual science centre practice – which is typically focused on increasing knowledge about

[19] PULSE is not an acronym, but is spelled this way in the project documents and project descriptions: "*Pulse is rhythmical, a beat of the heart, a movement. (...) The name PULSE reflects the exhibition's goals of learning, fun and improving health*" (Stentoft ,Magnussen, Aagaard-Hansen and Jensen, 2012: 1)

[20] Here, while acknowledging the differences between the institutions, we use the terms 'museum' and 'science centre' interchangeably about exhibition-based, informal learning contexts that include science centres, science museums and children's museums.

scientific phenomena rather than producing interventions and behavioural change (Bønnelycke, Grabowski, Christensen, Bentsen and Jespersen, forthcoming). The aim of intervening in everyday life and practices entails a rethinking of (1) exhibition design, (2) the role of visitors in this process, and (3) success criteria for the design process and product. Health promotion is based on principles from the Ottawa Charter (WHO, 1986). Taking a health promotion approach entails working holistically, addressing the complexity of health issues, and understanding health as it unfolds in everyday life (Grabowski, Aagaard-Hansen, Willaing, and Jensen, 2017). Perhaps most importantly, health promotion emphasizes the active participation of target groups to develop the competences to gain control over one's own health, and ensure relevance and legitimacy (Jensen, 1997).

At science centres, participatory exhibition development is becoming an increasingly popular way of working towards more inclusive and audience-relevant exhibits (Mygind, Hällman and Bentsen, 2015; Simon, 2010). However, this is a novel approach and not yet a widespread or customary practice. Despite numerous studies of audience participation (Arnstein, 1969; Clifford, 1997; Knudsen, 2016; Mygind, Hällman and Bentsen, 2015), the complexity, negotiations and untidy processes of participatory practices in museums remain poorly understood, and investigations are needed to better understand the dynamics of sharing authority in these processes (Knudsen, 2016). Furthermore, the meeting between museum and health promotion has not yet been thoroughly researched (Christensen, Bønnelykce, Mygind and Bentsen, 2016). There is thus a need to study processes of collaboration and co-development to better understand the challenges and gains. Involving audiences in museum-based health promotion requires reflections on the aim of the participation, as well as on its practical and institutional relations. Through the case of the PULSE project, we study how co-design frames the meeting between disciplines, and we discuss the strengths and challenges implied when involving the audience in this process.

In the PULSE project, designers, researchers, and families came together to co-design a health promoting exhibition at a Danish science centre. We investigate how the co-design process was shaped by the meeting between the fields of health promotion research and science centre design practice, and what the implications for the final exhibition were. We describe how audiences and professionals from the respective disciplinary backgrounds were redefined and repositioned. The two disciplines contributed with different rationales, definitions and success

criteria for participation. Challenges and tensions arose and necessitated negotiations of expertise, authority and modes of participation. The ideal of visitor-involvement created tensions with existing design and development practices. It challenged notions of expertise, professional roles, and power relations, and complicated the translation of user experience into exhibition design. We recount the clashes and contradictions that occurred in this process, and describe the implications for the roles the visitors were given. In the analysis, we describe how certain modes of participation were enabled and certain kinds of expertise were performed, shaped by the project constellation and through the specific setup of the co-design process.

PULSE – health promotion through a science centre exhibition

The PULSE project is a six year-collaboration (2012-18) between the Danish research centre Steno Diabetes Center and Danish science centre Experimentarium. PULSE has the purpose of developing new methods for health promotion to Danish families. This is done through the design of an exhibition at Experimentarium (opened in March 2015), as well as a number of outreach activities, that encourage physical activity and provide an opportunity for families to have a shared, positive experience and dialogue about health. The exhibition consists of nine exhibits, placed around a centre titled 'the Mid-point': an area with interactive screens where visitors start and finish. Visitors can use the exhibits only when logged in as a group; they perform the activities as a group, and get feedback as a group. Each exhibit in PULSE displays a familiar, domestic environment, albeit changed into a place for jumping, playing and dancing. The family can play 'the floor is lava' in a topsy-turvy kitchen, use a revamped bathroom as a dance floor, and try a rodeo-armchair, and more. At the Mid-point, the family group can see pictures that were taken while they performed the activities, take quizzes and obtain factual knowledge about the activities and their health benefits. The design is intended to inspire a creative and physically active re-appropriation of the home and its surroundings by creating a zone for playful experimentation and social interaction within the family and their everyday life.

Exhibition development process and methods

The development of PULSE was different from usual design procedures at Experimentarium due to the collaborative and experimental setup. Involving the visitors was not uncommon in the organisation, but this approach had hitherto taken the form of classic product

testing through, for example, prototype tests or focus group interviews. The breaking up of existing power structures and inviting researchers and visitors into the early development stages as equal participants, rather than consultants or test-groups, was a new venture. The ambition was to base the development process on health promotion approaches, and the PULSE development team therefore consisted of exhibition designers as well as health promotion researchers, (see figure 1). Moreover, the project aimed to develop new methods for user involvement and health promotion through this collaboration.

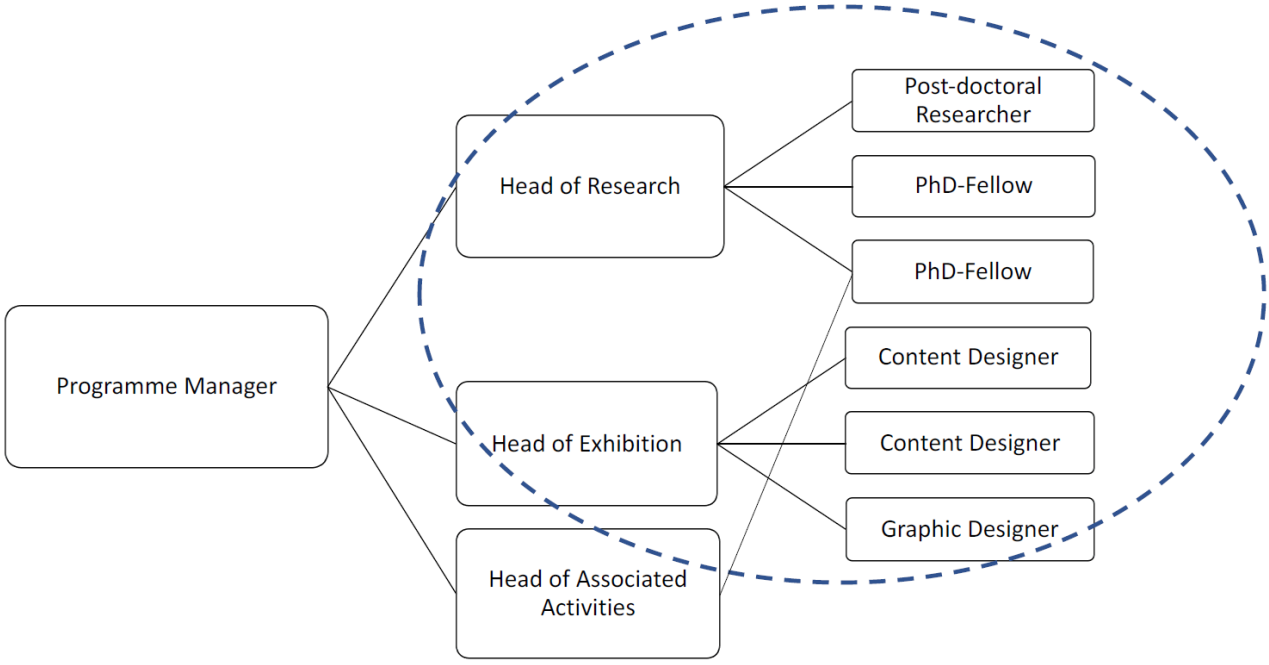

Figure 1. The composition of the PULSE team. The dotted circle line indicates the people involved in the processes that were analysed in the present study.

Recruitment took place via advertisements in free local newspapers in two selected areas of Copenhagen. Families were defined as one or more caregivers living with one or more children aged 6-12 years. Ten families were selected to participate in the development process. The selection of the participating families was based on a wish to encompass a broad range of family structures.

The development process included two different phases: (1) a qualitative front-end study, driven by the researchers, using ethnographic methods to unfold the families' everyday health

practices; (2) two workshops that were planned and facilitated by researchers and designers jointly and a third workshop that was planned and run solely by the designers.
The project thus employed two different visitor-involvement strategies: A strategy of visitor-informed design, based on the research-based knowledge about participants' everyday life and health practices, and a strategy of participatory design with the visitors participating in discussions and design exercises relating to possible exhibition design (Gaver, Dunne, and Pacenti, 1999; Halse, 2008). The families participating in the front-end study were assigned to photo-document their own movement and health for a week as it unfolded in their everyday lives. The photos formed the focal point for a family interview in the home, along with a mapping exercise, where the families charted their activities and daily schedules for a week. This shaped a dialogue about desired health practices, challenges, and possible spaces for increasing movement together. By this, the families were enabled to articulate and define the health dimensions and practices that mattered most to them–and their definitions were broad, including doing laundry and shovelling snow, alongside formal sports activities. The ethnographic study provided rich descriptions of health views and practices that were condensed by the researchers into a palette of themes relevant for the exhibition development (cf. Braun and Clarke, 2006). The themes were *motivation, a family outing, work and gender roles, health,* and *media and games.* This material was presented and discussed with the designers and resulted in a general awareness of the sensitive nature of the subject of health and a focus on creating shared activities.

The second phase of the development process consisted of three co-design workshops with the families working from the insights gained from the front-end study.
The main objective of the first workshop was to generate ideas in collaboration with the families about how to create a relevant and informative exhibition experience on the subject of health. The team designed a game to involve the families (Brandt, Messeter, and Binder, 2008; Halse, 2008). The design-game was played on a game board depicting everyday settings such as school, home and workplace, complemented with interview quotes and photos from the fieldwork. Each player was provided a gaming piece in their own image, and was asked to use these props to tell a story from their everyday life about challenges they experienced regarding physical activity. Then the families could select tentative exhibit design ideas to discuss whether these could address their challenges. The designers created the tentative exhibit ideas based on the front-end

study and presented them on cards with a drawing and an accompanying short text. Subsequently, these ideas were elaborated, merged or discarded by the families, and prioritised with the aid of a target-board. Lastly, the families used their gaming pieces to act out an imagined visit to the science centre to see the health exhibition (see Sandholdt and Ulriksen, forthcoming, for a detailed description).

The data from the design-game workshop was analysed and refined collaboratively by researchers and designers. The exhibit ideas were reformulated and new ideas were developed. For instance, the designers decided not to incorporate school and workplace settings in the exhibition, but to focus exclusively on a domestic setting, based on the families' input. The second workshop with the families focused on discussing possible atmospheres and narratives for the exhibition. The children were asked to build an imagined exhibit using LEGO. For the parents, picture cards[21] were used to generate ideas, by asking them to choose and tell a story about two pictures that reminded them of a challenge they wished to address, or a mood or an environment they would like to emulate.

The designers used these stories to formulate a narrative and concrete exhibit ideas, and then invited the families back for a third workshop. Here the families had the opportunity to add input and critique on the exhibition environment as a whole. The designers curated the exhibition from here without further involvement of researchers or families.

The focus of the present article is on the process of involving families in the open and idea generating phase of the design process, where researchers and designers worked side by side.

Methods and analytical approach

The development process was documented through qualitative methods (Hammersley and Atkinson, 2007; Spradley, 1979; Tjørnhøj-Thomsen and Whyte, 2008). Observation notes, photos, videos, process documents and workshop material were saved as data. Furthermore,

[21] http://www.pickapicture.dk/da/

interviews regarding the development process were conducted with the designers as part of the data generation, both during the project and after its conclusion. The interviews focused on the project's purpose, goals, results and experiences, both in terms of the end products (the exhibition and outreach activities) and the collaboration and co-design process. Interviews and workshops were audio- and video-recorded, respectively, transcribed verbatim, and coded and analysed thematically (Braun and Clarke, 2006). From this, themes of rationales, positions of expertise, and enactment of competence, emerged. We analysed these themes as being enacted through the co-design process and its particular constellation of actors, with a focus on the tensions, negotiations and alignments between them (Jespersen, Bønnelycke, and Eriksen, 2013; Lassen, Bønnelycke, and Otto, 2015).

Co-designing a health promoting exhibition

In this section, we describe and analyse the PULSE co-design process in which the complex realities and experiences of the participants met with the ideas and ways of working in the project. In the co-design process, the participants were constituted as experts in certain fields and with certain modes of participation, being assigned different degrees and kinds of influence over the process. Furthermore, tensions and uncertainties arose due to the co-existence of different rationales for performing co-design; different perceptions of the partners' contributions and positions required on-going negotiations and adjustments.

Co-design and competence development

In the original funding application for PULSE, the project description is firmly based on theoretical concepts and methodology from health promotion and action research, where dialogue, participation and development of action competence are central components (Green, 2010; Jensen, 1997; Kristensen, 2014; Wistoft, 2009). Four educational principles are formulated as central in the development process:

- Participation and action competences
- A broad and positive health concept
- Multiple approaches for multiple settings
- Equity in health–reaching new target groups

(Stentoft, Magnussen, Aagaard-Hansen, and Jensen, 2012).

Within health promotion, participation is seen as a prerequisite for the development of action competence; the ability and willingness to gain control over, and improve one's health (Jensen, 2005). In this vein, the task of PULSE was to promote action competence regarding health and movement in the target groups, through visiting and using the exhibition, thereby sparking an interest in changing their lifestyle and implementing the suggested approaches to movement in everyday life. Furthermore, the project web page (http://www.steno.dk/da/Forskere/research_projects_overview/overview_projects_health_promotion/Projekter/pulse) states, that:

> PULSE will provide insights on participatory approaches to health education, action-oriented modalities of science communication, user-driven development of exhibition concepts and neighbourhood involvement in setting up local solutions concerning health communication and promotion.

These excerpts express how PULSE was based on an alliance between health promotion and science education, aiming at 'translating' health promotion approaches into exhibition features and exploring the science centre as a new setting for promoting health. The approach assembled visitors, designers and researchers, with the aim to unite ambitions and values from the two disciplines together with everyday experiences regarding health. This was to be achieved through a co-design methodology.

In research literature, co-design is envisioned to enable democratic design, solve social problems and connect with the marginalised (Binder, Brandt, Ehn, and Halse, 2015).

Co-design can be defined as 'collective creativity as it is applied across the whole span of a design process (…). Co-design refers (…) to the creativity of designers and people not trained in design working together in the design development process' (Sanders and Stappers, 2008, 6). In this tradition, participation becomes tied up with acknowledging the outsiders as equal participants, inviting them to be temporary insiders (Kensing and Greenbaum, 2013). The users are given the position of experts of their own experience, although participatory processes and the degree of user-involvement can take different shapes according to the goal of the project (Mygind, Hällman and Bentsen, 2015). Co-design therefore holds all the possibilities to create the envisioned design process. The ambition was to spark a cross-pollination between research

and practice and bridge the gap between expert knowledge on health and the user-groups' health behaviour through engagement.

Conflicting rationales for co-design

The co-design process was a new undertaking for the science centre not only with respect to the visitors' specific roles in the design work, but also in terms of developing methods for user involvement. From the beginning, it was unclear how visitors should participate, and how their experiences and input could be translated into the exhibition design. It was likewise a new experience for the researchers to take part in an exhibition-design process. Since the researcher-designer collaboration was new for all parties, roles and expectations regarding output and the coordination of different working paces had to be negotiated accordingly. The handling of these insecurities proved a constant struggle throughout the project. One of the reasons for the lack of clarity about how the visitors should be involved could have stemmed from a lack of a common rationale explaining why they should be involved.

Mygind, Hällman and Bentsen (2015) suggest three different rationales: (1) a pragmatic rationale, founding user involvement on the wish to improve products by mobilising users as scaffolds for the innovation process; (2) a theoretical rationale, based on the assumption that in order to surmount language/disciplinary differences and understand each other, participatory methods are needed to incorporate different perspectives into development; and finally, (3) a political rationale, with a democratic motivation to facilitate participation, and often a focus on marginalized or underserved groups (Mygind, Hällman and Bentsen, 2015). In the PULSE project, these different rationales co-existed and created tensions. The researchers, with their theoretical baggage from health promotion, drew mainly on a political rationale for the involvement, aiming to fulfil the democratic ideals of health promotion. The designers predominantly worked from a pragmatic rationale, based on a wish to improve the designs and create exhibitions with high visitor ratings, frequent use and long staying time.

Not surprisingly, the difficulty of reconciling these different rationales influenced both the involvement of the visitors and the role and authority of the researchers in the development team. Entering the collaboration with unfamiliar practices and critical perspectives, which in the eyes of the designers slowed down the development process, the researchers were perceived as obstacles, or

even threats to the designers' expertise. The Head of Development and PULSE Programme Manager described it thus:

> And who runs the process? Is it the researcher dictating: "These are the right methods," or "You have to listen to the answers from the visitors"? Otherwise it is very frustrating for the researcher to work with the users, and hear all these things, and then see that the content designers don't act on it. There is a hierarchy that hasn't been properly established. The researcher has been in PULSE, and told us what is important for the visitors. And there are some things that need improving in PULSE. But for the designers to accept that…

The quote demonstrates an ambiguity that persisted throughout the collaboration process, although the collaboration slowly took shape and roles were assigned.

Making experts and distributing competence in an ambivalent choreography

The collaboration created a distributed landscape of competences where certain kinds of expertise were ascribed to specific partners, allowing them different kinds of influence over the process. Tensions arose as it became evident that the expectations of the project participants with respect to their own roles, those of others, and the distribution of authority, could not always be met. Previous visitor-involvement at the science centre had either been in the form of focus groups prior to the commencement of the design process, or focused on concept or functional testing at the end of the design process. However, co-design is something that challenges the existing power structures by requiring that control is shared with the users (Sanders and Stappers, 2008). One challenge regarding granting visitors the role of equal participants with equal expertise, was the issue of changing the design processes, and renouncing power and control. This was expressed by the director of exhibition development:

> I think we are also up against something cultural. It is bloody fun to be an exhibition developer. And it is a blast to be a designer. And you have to think that it is equally fun to give up that power to the visitors. And you have to see the sense in that. (…) What matters to the designers is not necessarily what matters for the visitors. But I also believe that the designers know some things the visitors will never be aware of. So if you only listen to the visitors you will lose something, I think. So it's a tremendous balance.

The different partners conceptualised the visitors in different ways throughout the process, based on their diverging approaches to the *why's* and *how's* of visitor participation. This entailed differing assumptions about the visitors' capabilities and which kind of contributions they could make. Through the co-design process, they were positioned as both powerful sources of knowledge and experience relatable to others in similar situations, and as beneficiaries of the health promotion concept that had not yet come into being. They thus oscillated between teachers and learners, between knowledgeable experts and frustrated seekers of support for change (Jespersen, 2007). Thus, the participants were tasked both with defining what they needed to learn, and explicating how they wanted to learn it. Sometimes this was an enjoyable task and a challenge that positioned the participants as resourceful and creative, and sometimes it proved too much to juggle at once, or it exposed insecurities and perceived inadequacy. It created confusion: Should the participants expect fun or guilt, questions or answers, were they here to teach or to learn? When asked why they wished to participate in the co-design process, quite a few participants expressed a double position of wanting to learn more about being healthy, while at the same time crediting themselves as knowledgeable about health, and being able to pass on something to others. The participation became, for the families, a means of convening their own expertise, of demonstrating their skills and knowledge for others to benefit from, and at the same time it was an opportunity to engage in a learning process where they could gain new knowledge and competences. On the other hand, participation was an emotional process, exposing inadequacies and guilt, and touching upon personal and family matters. Some participants expressed frustrations or being overwhelmed by the intimate nature of the topics discussed, and some withdrew. The participation process thus also exposed the ambivalences of health and the complexity of dealing with health matters.

In the ethnographic study, the participants were cast as experts in their own lives and experiences. The methodologies were selected and developed to enable the families to show how and why they performed health, exercise and family life as they did, and to express their beliefs, values and motivations. They also pointed to wishes for improvement, based on their experiences and perspectives. The families engaged in future scenarios for family activities, based on present experiences and practice (Brandt, Messter and Binder, 2008).The approach was thus asset-based rather than based on assumptions about the lack of skills, motivation or knowledge (Green,

2010). The study was performed in the participants' own homes in order to emphasize their specific position as experts.

Following the front-end study, the researchers performed a preliminary analysis and thematised and presented the material for the designers in a workshop. However, this did not happen without some struggles. Several designers later referred to the workshop as troublesome and fraught with tension, questioning the usefulness of the ethnographic material. The families had very different health practices, everyday lives and needs, with conflicting values and emotions. This made the material hard to translate and it broke with existing prejudices that families needed more information on health. Instead the material unfolded a high degree of health knowledge, but many challenges as how to act on this knowledge. The researchers endeavoured to stay true to the complexity of the material, to do justice to the ambivalences and entanglement of health and family practices, rather than presenting idealised visitor types. The designers, having expected clear-cut and directly design-translatable results, at first expressed confusion and frustration over the evasiveness of the material, and some directly challenged its usefulness. The tensions stemmed from different expectations regarding the role of the researchers in facilitating the visitor participation. The designers had expected the researchers to present clear statements about who the visitors were, what they wanted, and how to accommodate this. Whereas the researchers saw themselves as mediating contact with the visitors, and paving the way for their participation as equals, the designers expected the researchers to provide leadership in the visitor-involvement process, and to interpret visitor perspectives to fuel the design process with clear-cut, 'expert' statements and recommendations, to assert their position as those knowing how and what to do. Instead, the designers felt left to their own devices with no clear idea about how to build on the visitor experience.

> Project manager: It was a lot like we… drew on the experiences we had from before, from methods we already knew, and… that was probably good enough, because for us it was new just to spend time on this, to get together all these people from Experimentarium and develop this, how we would go about these meetings with the users (…) Maybe then it could have been more democratic. I think that we, exhibition-wise, have dared making concepts and things we have never done before, but I also think we would have dared to be even crazier if we'd had that support – no, not support... collaboration with someone more secure in their methods. (…) Someone who'd dared saying: This is what the users WANT, so let's go ALL IN on that!

The challenges in incorporating the visitor knowledge stemmed from different expectations regarding the role of 'expert'. The researchers employed a strategy of complexification and posing questions rather than providing answers. The designers, having expected the researchers to be the experts on how to translate visitor experience into design briefs, were disappointed with a researcher role that appeared vague and insecure. The researchers, conversely, had conceptualized themselves as mediators between designers and visitors, with an emphasis on letting the visitors shape and decide, based on their own expertise and experience. It appeared that the collaboration created a distributed landscape of competence, where designers possessed specific knowledge and expertise within the creative and aesthetic field, whereas the researchers were conceptualized as health experts, and the families as experts in their everyday life, and these demarcations were hard to transgress. Rather than dissolving boundaries and creating co-learning and synergy, the collaboration seemed to emphasise contrasts and barriers by adhering to a distribution of expertise that did not correspond with realities, where families might possess health knowledge or aesthetic skills, and researchers and designers might also represent family and health experience. However, after actively engaging in discussions about how the insights from the ethnographic material could feed into the design process, the designers expressed optimism and satisfaction with the possibilities of the material. The front-end phase allowed the project team to get to know their target audiences' everyday lives and emphasised the importance of social relations and values in the performance of health practices. This led to a stronger focus on social dynamics within the family, rather than only the actual health content, and to a reconceptualization and reformulation of the capabilities and needs of the visitors, which changed the way the designers talked about the visitors and their pre-existing competences. The visitors were thus recognised as already knowledgeable about healthy behaviour and recommendations.

Challenging health approaches and priorities of arguments

In the two first workshops in the development process, the PULSE families were invited to generate ideas and scenarios for the future exhibition using tools to think with, such as cardboard game-play in the design game and LEGO bricks (Brandt, Messeter and Binder, 2008). Here, the participants were granted power to challenge and prioritize ideas. This was particularly evident when working with the ways of representing health or staging family interaction. Despite intentions, the designers' initial visions and ideas reflected normativity and values from dominating health

discourses. This clashed with the everyday lives, values and emotions of the participants. From the outset, the project team struggled with how to translate health promotion into exhibition design, and how to approach the notion of health. The project description (as quoted above) stated that the project was based on a broad and positive notion of health, inspired by the field of health promotion. In the context of the science centre, the concept of a broad and positive notion of health was directly translated into creating a fun learning experience. The duality of learning and having fun was essential for the designers and the Experimentarium brand, and proved a balancing act for developing health promotion, as any negative associations and experiences were to be avoided, as the positive, motivating and empowering experience was imperative.

> Experimentarium CEO: People don't come here because they think: "I'm going to Experimentarium so we can live longer and healthier" [laughs]. They come because they think it's great fun, and as a parent you think that your kids might learn something. (…) We just have a whole other contract with the visitors when they come. It's about having fun with your family, or about playing and learning merging together when you come with the school.

There is, however, an inherent paradox in the health promoting ambition in itself, based on the contradictory meanings of health entailed in dominating health discourses (Otto, 2008, 2009). As others have pointed out, the agenda of health promotion can be conceived as both moralising and paternalistic, while mobilising notions of empowerment and competence (Vallgårda, 2001, 2005). This came to the fore when preconceptions met with the complex realities of the visitors. The designers strived to maintain a playful and non-normative tone and to avoid 'preachy' or moralising messages, but participant responses often disclosed how difficult it was to avoid reproducing dominating health discourses. The participants were ambivalent about physical activity, knowing that it was good for them, feeling they could do better, and most of all, that they ought to enjoy exercising. Even the most active families expressed frustrations and feelings of inadequacy in relation to exercise, and balancing family time and careers.

> Mom to twins: If I could just learn to relax once in a while. I know; it's a bit contradictory to what you're trying to make us do, but I think about mental relaxation: To sit down, make myself relax, right? Only there isn't enough time for that (…) So I would say, that it's also a part of being balanced: To be able to–well be less restless, right? But it's just because I've got so many THINGS I'd like to do.

Some parents expressed concern that their children were overly focused on health, and described an exaggerated health focus as counterproductive to wellbeing. Other families were aware of health recommendations, but had more prevalent challenges, such as affording rent rise, language barriers, and experiences of violence and a lack of safety in their neighbourhood. Their wishes were more along the lines of positive shared experiences, feelings of safety and relief from the everyday challenges.

> Single mom of four children: So I think it's really hard to be alone with them, and then also having to attend activities with them twice a week. So even if [the two youngest children] both want to go, I simply cannot make it work. (…) Also because then two out of five weekdays I have to go with them, come home late, cook dinner and all those things, and that's how it is when you're divorced. (…) it's hard to make ends meet, I think it's hard because health takes time, and in my head I want to live like that, but sometimes it's just not possible, and sometimes you just have to have a breather, and say that's how it is, because I'm all they've got, and I have to take care of myself as well, and I have to breathe too.

The design team strived to accommodate the issues expressed, e.g. feeling inadequate in living up to the known health recommendations, by not directly advising for or against any kind of behaviour or setting specific standards or goals. Even so, a number of ideas were challenged by the participants. Not all participants wanted to be presented with health issues and to be encouraged to do more physical activity when coming to the science centre. There were a number of ideas related to activities based on competition that were downright rejected by the participants. For instance, participants overruled the ideas of nominating the family's couch potato, challenging mum to join the game, or other activities that would expose a lack of competence or put family members on the spot. Some participants disagreed with the presented assumptions about what could motivate a family or what might be fun. In the second design workshop, one participant balked when presented with a design exercise where the participants were asked to commit to changing their everyday habits and activities into scheduled physical activity with the family. She commented that this was not what she would expect when coming to Experimentarium:

> Mum: I could do without those questions about how we could make Mum move around more (…) I don't want to discuss this kind of thing when we're out to have a good time (…) I

> honestly don't want to think about that when I'm at Experimentarium (…) It should be positive and fun, and not about guilt.

This participant did not see the science centre as a suitable place for intervening in her private life and issues. In some respects, the incident questioned the appropriateness of the science centre as a setting for health promotion. In other respects, it supported the original science centre narrative about being primarily a place for fun learning. The incident reinforced the notion that a science centre should not intervene or preach or induce guilt, or in other ways invoke negative aspects of health. Based on the insights from the involvement of the families, the design team decided to downplay the focus on health and right and wrong behaviours, instead emphasising the social experience as play and togetherness. With this approach, the exhibition was able to cater to the families' preferences for having fun experiences together while introducing health in a subtle and positive way. Indeed, evaluations of PULSE show the majority of the visitors emphasise the collaborative and social aspects as the most important parts of the exhibits, rather than factual knowledge (Zachariassen and Magnussen, 2016). In fact, many visitors don't realise PULSE is about health (Zachariassen and Magnussen, 2016). This was the result of the co-design process, which revealed the complexities and paradoxes of health promotion when setting out to deal with real-life problems as experienced by the visitors, and when engaging in dialogues with the participants. Through the co-design process, the participants were given the authority to challenge the envisioned approaches to health promotion, and through their resistance, which necessitated negotiations and adjustments, they also challenged the ideas about what a science centre is, how it can engage its audiences, and how health promotion can be performed in a science centre setting.

Conclusion

In this paper we have described the PULSE co-design process as a process of ambivalence, negotiating differences and tensions regarding the translation of health promotion into a science centre setting. The co-design process disclosed challenges in operationalising and reconciling different, co-existing rationales for visitor involvement, and insecurities and tensions regarding roles of the project partners and participants. The coexistence of the different rationales caused different interpretations of the meaning and motivation for the visitor involvement, and thus

different success criteria emerged. For the designers, working from a pragmatic rationale, the main success criterion was to create a good design product, meaning an exhibition that met aesthetic demands and achieved audience popularity measured through staying time and number of visitors. This criterion shaped how they conceived the visitor involvement and the kinds of expertise they expected the visitors and researchers to provide. For the researchers, mobilising a political motivation for participation, the participatory process in itself weighed heavily in terms of achieving the democratic goals. This shaped their approach to the visitors, and how they conceptualized the expertise and participation of the visitor, in a way that was different from that envisaged by the designers, leading to tensions regarding expertise and authority.

We have analysed the participant involvement in co-design as a process of granting authority and enabling certain positions of expertise through the stages and methodologies of the co-design process. In the co-design setup, the participants were given certain roles, forms of expertise, and modes of participating. This enabled them to contribute in specific ways through negotiations and adjustments of expectations along the way. These expertise and authority were not pre-existing, but something the participants were enabled to exert through the co-design process. The participants were made experts in their everyday lives and experiences, and given the authority to achieve closure on arguments regarding how to approach health promotion in exhibition design. Previous visitor-involvement processes; primarily centred on technical testing and input on specific functions or content of exhibits, provided a very different kind of knowledge than the insights stemming from a more explorative and comprehensive co-design processes. The in-depth work with visitor participation in PULSE presented the design team with complexity and ambivalence, posing challenges in translating this complexity into exhibition design and handling the ambivalence of values, practices and identities related to health. The concerns and challenges regarding healthy, active living were different from what the design team had expected. This difference challenged expectations about what kinds of knowledge and forms of interaction the visitors needed or wished for, even challenging the appropriateness of a science centre as a setting for health promotion. It did, however, also enable the production of a health promoting exhibition that reflects the ambitions to create dialogue, to explore types of physical activity that are different from those normally associated with formal exercise, and to accommodate the wishes of the participants to avoid normative health recommendations.

In summary, rather than providing clear-cut solutions and empowerment of the participants, the co-design process produced ambivalence and disclosed uncertainties about authority and expertise, and differences in expectations and goals. The co-design approach was a means to enable different disciplines to meet and to involve the visitors, enabling negotiations over the distribution of expertise and how to represent health in a science centre setting.

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Article 4: Health, fun and ontonorms: museums promoting health and physical activity.

Paper for Museum Management and Curatorship

Julie BØNNELYCKE[a], Dan GRABOWSKI[b], Julie H. CHRISTENSEN[c], Peter BENTSEN[d], & Astrid Pernille JESPERSEN[e]

Abstract

In recent years, an increasing amount of museums and science centres have taken to designing exhibitions with a health-promoting agenda. Drawing on Dutch philosopher Annemarie Mol, we analyse three health-educating museum exhibitions which promote health through play-based and hands-on approaches, and suggest that they enact ontological norms and specific health subjectivities: while aiming to promote health in a positive and dialogic manner, they nevertheless present 'right' and 'wrong' kinds of health behaviour. They thus define good lives in a specific manner, and they assume that by providing knowledge, visitors will work to accomplish the goals the museums have defined. Thereby, the exhibitions tend to enact what Annemarie Mol calls *the logic of choice* which does not accommodate the complexity of everyday life. We contend that the health education provided in the exhibitions tends to take a normative and authoritative tone. Hereby, the museums seem to steer towards a positivist learning paradigm, and a role as authority, instead of a forum where audiences can participate on equal terms in discussions of socio-scientific issues. The turn to health in museums thus seems to enact a knowledge deficit similar to the original museums, rather than providing open-ended learning and meaning-making.

Keywords: democratic education, exhibitions, health promotion, logic of choice, open-ended learning, physical activity

Introduction: the turn to health in museums

The rising, global concern regarding non-communicable or lifestyle diseases is continuously leading to the exploration of new settings for performing health promotion (de Leeuw, 2013; Sparks, 2013, 2014). The various approaches taken to prevent lifestyle-related diseases and to promote health and healthy lifestyles often face difficulties in presenting health and health communication in a way that is appealing and makes sense to the target group (Petraglia, 2009). Research shows that many health campaigns have little or no effect in terms of changes in health behaviour, and only manage to appeal to people who already lead healthy lifestyles (Grabowski, 2013; Peters et al., 2009;). Because of their abilities to provide engaging

learning experiences, museums have recently been appointed promising spaces for health promotion[22]. It has been argued that museums might have a unique position to educate about health in a relevant, tangible and positive manner (Chatterjee & Noble, 2013; Christensen, Bønnelycke, Mygind, & Bentsen, 2016). In recent years, an increasing number of museums on both sides of the Atlantic have turned towards addressing issues of health and well-being, or even taken to designing exhibitions and outreach programmes with a health-promoting agenda (Christensen et al., 2016).

We focus especially on science museums and children's museums, where the attention to health has been particularly significant, and in which the greatest prevalence of exhibitions and programmes with a health-promoting perspective has been found (Christensen et al., 2016).

The first generation of museums largely built on a strongly authoritative communication strategy, and a positivist learning paradigm, conceiving learning as primarily a one-way transmission to the public (Amodio, 2013; Bandelli et al, 2009; Hein, 1998). The museums thus enacted a 'knowledge deficit', where the assumption was that the public was in need of knowledge and enlightenment, and the museum was an authority that could teach the right answers. The second generation of museums in the late 20th century turned towards a constructivist learning paradigm, where audiences were recognized as co-producers of knowledge, and learning as social and situated (Hein 1998; 2005). In the third generation of museums, the museums are increasingly conceptualised as fora for discussion of socio-scientific issues, where visitors are to actively participate in the generation of knowledge (e.g. Ecsite mission statement http://www.ecsite.eu/about/mission;) (Crowley, Pierroux & Knutson 2014; Merendino & Clark, 2010). The aim is to transform museums from disseminators of pre-defined knowledge, to facilitators of dialogic learning and knowledge brokers (Simonsen, 2016). In sum, museums have changed their relationship with the public from one of authoritative and normative one-directional communication, to an approach where audiences are involved,

[22] A note on our use of the concepts 'health promotion' and 'health education'. We consider health education a subgenre of the wider field of health promotion, where health promotion has a broader action area and wider array of methods. When we describe the museums as 'health-promoting', we thereby mean that they conduct health education.

engaged and considered equal participants in meaning-making and in the definition of important social and scientific issues. This framing of museums correlates well with the founding tenets of health promotion, emphasising dialogic and democratic approaches to increase health awareness, knowledge and empowerment. It is a relatively new area for museums to venture into health education and health promotion, and the area needs more research (Camic and Chatterjee 2013; Hamilton et al. 2003). However, the potential of the museums as health-promoting actors has been described in numerous recent works (besides the below-quoted works, see for instance Camic and Chatterjee 2013; Chatterjee and Noble 2015; Hamilton et al, 2003); however, few publications exist on the effects and implications of health promotion in a museum context (Christensen et al., 2016). Museums promise to offer interactive, social and meaningful learning experiences that can contribute positively to health and well-being (Chatterjee and Noble, 2013; Simon, 2016). It has been argued, that museums have the potential to provide life-changing experiences, which can be employed to promote health, as expressed by the Director of the National Museum of Health in Georgia, David Roland:

> With their high credibility, existing distribution platforms, access to diverse communities, and capability to educate and inform, museums can play several key, health-related roles. (…) Museums can provide high impact, emotional experiences with the ability to change the way people behave, (…) So if we have that kind of power, let's use it to change behaviours and guide people in healthier directions (Roland, 2010, 169-173).

As stated in the above quote, museums have power and abilities to change not only people's knowledge and perceptions about the world, but can *steer their audiences in specific directions*. This directly signifies an interventionist agenda for museums, one that aligns well with the dual purpose of education and intervention within health promotion. As others express it, the health-promoting agenda also aligns well with the existing raison d'être of the contemporary museum, indeed it seems to be an obligation for the institution:

> If it is the mission of the contemporary museum to advance understanding of science, culture, and our world, then health and wellness topics are integral to that mission. Museums (…) can broach these topics in advance, promoting wellness rather than treatment, and can offer ways of reasoning through core concepts by engaging people in thinking as a group about health in proactive and positive ways (Koke and Fraser, 2010, 158-159).

As expressed in this quote from Koke and Fraser (2010), the agenda of modern-day museums is to *engage audiences and create ways of reasoning and relating to socio-scientific and cultural issues, including health*. There is a notable difference between the two descriptions of how the museums can contribute to health promotion: the first suggests that museums should steer people in *the right* direction, thereby entailing a predefined definition of the right kind of knowledge and action, whereas the second presents health as a socio-scientific issue that audiences can *participate in*. We will engage with this difference in our analysis and discussion in this article.

Firstly, we will introduce the discipline of health education, its focal areas and most prevalent challenges. Then, we will provide an account of our analytical approach, based on Dutch philosopher Annemarie Mol's critical analyses of the normativity and subject prescriptions within health advice before we turn to our empirical field: three health-promoting exhibitions, which we analyse for their enactments of health, ontonorms and relations between visitors and museum. From our analysis, we produce the argument that the health-promoting exhibitions tend to reproduce normative and authoritative health education that defines health in specific ways and seeks to guide visitors in certain, predefined directions. This is a tendency often seen in health education and health communication, but goes against the ideals of museums and science centres to provide open-ended and dialogic learning opportunities.

Health promotion: approaches and challenges

The 'discipline' of health education is mainly characterised by being interdisciplinary and multifarious. Health education is by the WHO defined as "*learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes*" (http://www.who.int/topics/health_education/en/). Health education can be defined as a subgenre of health promotion, concerned with promoting health literacy and action competence, i.e., knowledge about the factors influencing health and the ability to act upon these (Green and Tones, 2010; WHO, 1998). The WHO definition of health which is a basic tenet of health education, formulates health as "*a state of complete physical, social and mental wellbeing*"(WHO, 1946/48), and stresses the importance of working with a broad and positive notion of health (WHO, 1986). This entails a focus on not just the prevention of disease, but a more holistic approach, defining health as encompassing physical, social as well as mental health and well-being (WHO, 1986). A common concern within health education is the

prevention of non-communicable or 'lifestyle' diseases, which have increased dramatically in later decades. A central challenge, however, is to actually reach the target groups and provide health-related learning experiences that are appropriate and relevant to them. It is a persistent challenge that health communication is characterised by top-down approaches that suffer from a disconnect with the everyday lives, challenges and values of the target groups (Green and Tones, 2010; Jensen, 1997). Medicalised notions of health, emphasizing disease, risk and behaviour modification, are highly dominant in public discourse, campaigns and health professional practice (Otto, 2008). Likewise, dominant is an individualizing health discourse which makes the individual responsible and accountable for his/her own health status – with the production of guilt and blame as a consequence (Vallgårda, 2005).

Danish professor in health education Bjarne Bruun Jensen argues that health education can be divided into two paradigms (Jensen, 1997): a moralistic and a democratic paradigm. The former characterized by being authoritarian, disease-oriented and behaviour-oriented, aiming largely at achieving predefined behavioural goals within a relatively closed definition of health. The latter, on the contrary, is characterized by a broad and well-being-oriented notion of health, aiming at increasing action competence through participatory approaches. Jensen notes that the moralistic health education is generally ineffective, i.e. rarely leading to the desired behavioural changes, because it does not take into consideration the target groups' own conceptualizations of the good life, and fails to acknowledge the structural and societal influences on possibilities for action. And, crucially, it does not provide opportunities for the target groups to reflect about the meanings and implications of health in their own life.

In contrast, the second paradigm within health education emphasises a dialogic approach to exploring possibilities for change in collaboration with the target groups (Grabowski et al., 2017; Jensen, 1997; Simovska, 2004). Rather than positioning participants as passive recipients of health campaigns and information, this active involvement promotes their ability to act and their sense of ownership and relevance (Jensen, 1997). The aim is to empower people to change their lifestyle and well-being by increasing awareness and knowledge of the factors that influence health and well-being, and supporting the development of competences and resources to control these factors (Bloch et al., 2014; Grabowski et al., 2017).

Based on these challenges of *reaching the right target groups*, and *reaching them in the right way*, health education continuously strives to develop new methods and engagement strategies to reach wider and create impact. It is in light of these concerns and challenges within

health promotion that we investigate and analyse the health-promoting exhibitions, to discuss how and whether they can counteract these.

Enacting health: ontonorms and bodies in health advice

In order to analyse the health-promoting exhibitions, we turn to Dutch philosopher Annemarie Mol, who has provided studies of the norms and logics enacted by current health care and health advice (Mol, 2008, 2012). Mol (2008) suggests that two opposing logics exist within health care: *a logic of choice* and *a logic of care*. *The logic of choice* assumes that by providing patients with information, they become equipped, indeed responsible, for making informed choices about their health. The downside to this popular and widespread conceptualization of patients as 'consumers' is the neglect of the situated, complex and variable realities that people have to navigate on an everyday basis, where information and advice are not directly applicable and do not encompass situations where 'the right' amount of sugar or fat intake or 'sufficient' exercise are not clear cut and easily definable. In opposition, Mol introduces the notion of the *logic of care*; a tinkering and situated approach where health professionals in collaboration with patients engage in the practical situations of health and everyday life, and for each moment judge and try out what might work best in a given situation.

In a later work, Mol introduces the notion of 'onto-norms'; the enactment of ontological norms about the body in health advice. Notably, Mol focuses on the relations between mind and body, individual and society that are implied in the dieting advice presented by dieticians. Mol posits that a dominant understanding of healthy eating is characterized by the notion of mind over matter:

> In the Netherlands as elsewhere, the overriding message of most dieting advice is that a person who wants to lose weight needs to overrule the desires of her craving body. Her mind has to put itself in a sovereign position and make 'good choices' about what to eat (Mol, 2012, 2).

Mol describes how dieting techniques tend to enact bodies that are problematic, endowed with a nature that strives for undesirable (i.e. fatty and sugary) foods under our present cultural and structural circumstances (e.g. sedentary lifestyle), and thus must be controlled by a disciplined mind. Mol's analysis also suggests that no kind of health advice is neutral: it creates ideals, risks, goods, and bads, and it produces different kinds of actors and action.

We understand Mol's logic of choice as one such onto-norm enacted by health education; an onto-norm which entails a mind-over-matter approach to health, where health becomes a matter of informed choice and motivation, rather than a practical engagement with the realities of the everyday. We use Mol's concepts to analyse three health-promoting exhibitions and subsequently to discuss the implications of museums promoting health: which health issues are performed in the exhibitions, and which solutions and responsibilities do they articulate? Which logics do they enact? Which relations between museums and visitors are created, and how is healthy living presented in a museum setting? This is carried out with the intention to examine the before-mentioned aspirations of museums to provide more positive and relevant health learning experiences, while fostering empowerment and critical decision-making, as strived for in health promotion.

We suggest that Mol's concepts can be used as analytical tools for studying museum exhibitions in order to identify and critically discuss their collateral realities (Law, Rupert, & Savage, 2011); the assumptions, implications and effects of specific communication approaches. This enables us to engage with the museums as co-producers of socio-scientific phenomena; agents that enact *matters of concern* in a specific way through their educational and displaying practice, and thus discuss their *ontological politics* (Latour, 2004; Mol, 1999): Which realities, audiences and issues are produced, and could or should it be done differently?

Empirical field and methods

Authors Bønnelycke, Christensen and Bentsen have previously conducted a scoping study of health-promoting exhibitions in order to explore the range of health-promoting exhibitions and analyse their approaches for disseminating health (Christensen et al, 2016).

For this article, the exhibitions were narrowed down to three to be subjected to a more in-depth study about the learning experiences they offer. Based on the material gathered for the scoping study, the exhibitions offered different approaches for educating about health: by focusing on physical activity through play (*PowerPlay*); on everyday settings (Healthyville); or on a life course-perspective (*You! The experience*). They were furthermore selected to encompass the range of health-promoting exhibitions, representing institutions with different target groups, namely science museums and children's museums, as the scoping study revealed that these museum genres are most often engaged with health topics. While acknowledging the differences between children's museums and science museums, we contend that they bear

comparison through their common aim to increase visitors' knowledge on natural, scientific and everyday phenomena – and in this case, health – through hands-on and playful approaches (Edeiken, 1992; Friedman 2010).

Bønnelycke conducted the fieldwork for the present article in March-April 2015, employing qualitative fieldwork methods (Hammersley & Atkinson, 2007; Spradley, 1979; Tjørnhøj-Thomsen & Whyte, 2008). This entailed visiting the exhibitions to experience them as visitor, by trying the exhibits, reading the texts and following the signs and instructions; performing participant observations in the exhibitions, focusing on the interactions of visitors with each other and the exhibitions, taking notes, photographs and brief videos, when possible. The museums also provided online learning material, which, alongside notes, photos and videos, were included as data material.

The exhibitions included in this article are *KidPower* at the Boston Children's Museum; *Healthyville* from the Stepping Stones Museum for Children (at the time of visit on loan to Long Island Children's Museum); and *You! The Experience* at Chicago Museum of Science and Industry. The resulting empirical material was discussed with the other authors, who provided analytical and theoretical input, co-wrote drafts of the article and contributed with discussions of analyses and text.

Power, fun and YOUR choice: health-promoting exhibitions from disco-dance to food deserts

Health-promoting exhibitions span across a variety of approaches to health, from physical activity, to diet, safety and disease prevention. The selected exhibitions represent different approaches to educating about health, thus enacting health as an issue in different ways, each with their normative implications. They enact different kinds of visitors, produce different allocations of responsibility, and present different goods and bads in relation to health.

KidPower: an active body is a powerful body

At Boston Children's Museum, the exhibition KidPower educates children and their caregivers about health under the overall framework of the body as an energy-consuming and -requiring mechanism, where the goal is to achieve balance between energy spent and energy consumed. A slogan states that: "*Balance and moderation are key to a powerful body"*.

35 The KidPower Exhibition, Boston Children's Museum

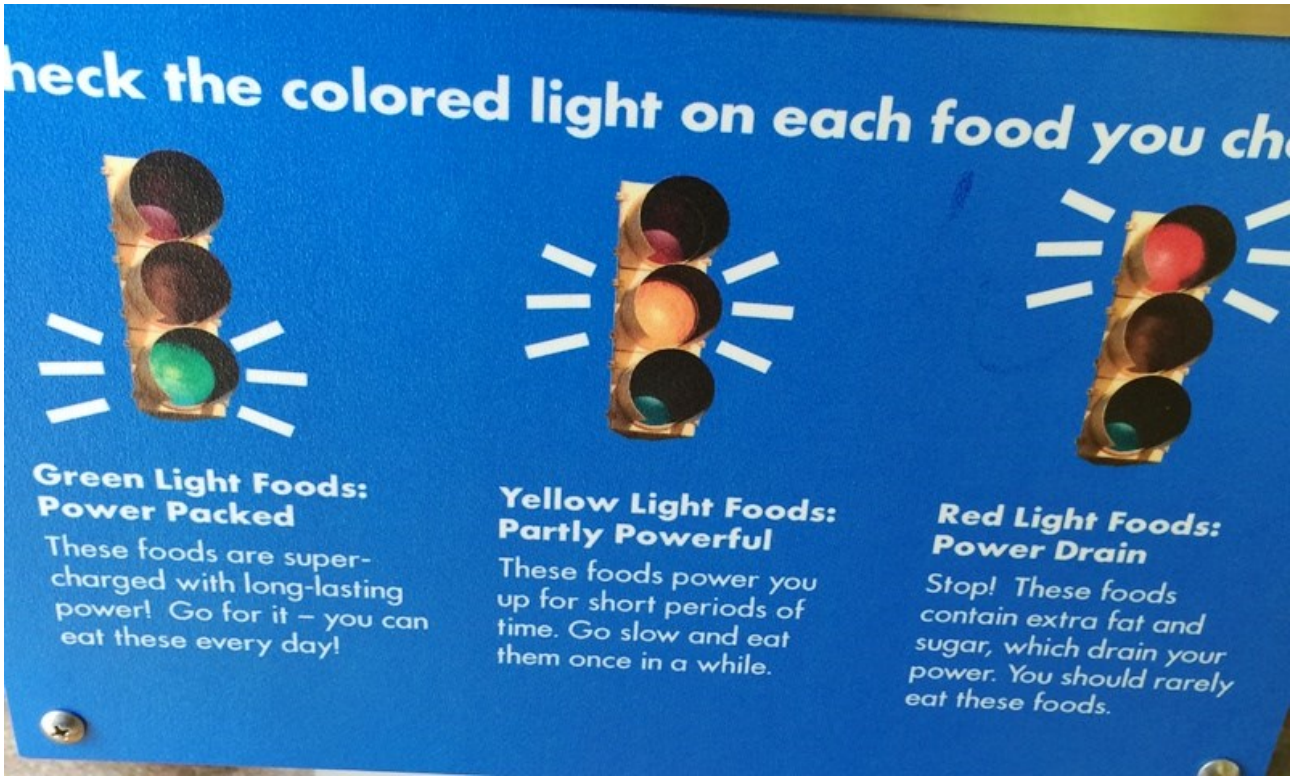
The exhibition mainly employs a language of power and strength rather than using the term 'health'. The power analogy is consistent throughout the exhibition, which combines factual knowledge with interactives about physical activity and nutrition and their effects on the body. The interactives provide possibilities for moving the body, using balance, speed, strength, and coordination on interactive disco dance-floors, balancing posts, climbing walls, and exercise bikes. The exhibition provides opportunities for moving the body and working up a sweat, which is combined with information about what happens in your body when doing physical activity, and suggestions as to how to be more physically active. Posts suggest trying new kinds of activity, both in- and outdoors: skating, jumping, skipping, bowling, and making your own obstacle course. This is accompanied with slogans like "*An active body is a powerful body*" and "*The more active you are the more powerful you will be*".

36 Signposts from the KidPower Exhibition, Boston Children's Museum

The focus on physical activity is supplemented with advice against inactivity, particularly television-watching. The exhibition suggests limiting television-watching to two hours a day, with a statement that "*2 or less is the key to success!*" Furthermore, an hour or more of physical activity a day is recommended to stay strong and healthy.

There are a number of exhibits where visitors can test their own habits, such as weighing if your energy intake (i.e. 'power in') is balanced with your energy expenditure (i.e. 'power out'). A "Powerstation" provides knowledge about the importance of breakfast, emphasized as the most important meal of the day. Visitors can try to compose their own breakfast with different foods from the categories of nutrients that constitute 'a balanced meal': fruits, vegetables, milk, meat/beans, and grains. A traffic-sign model rates the meals and foods

for their health value. At a water station, a sign encourages visitors to drink water instead of soda, along with the information that soda ruins the teeth and leads to weight gain, whereas water is fuel for the body. The overall approach is to provide easy, small steps to change everyday habits in a more healthy way, exemplified by signs: *Get big power from little steps. Take the stairs. Park further away and walk. Don't drink soda. Eat more fruit and vegetables.*



37 Traffic signs indicate how much of each food group you should eat. Boston Children's Museum

The exhibition provides concrete examples and advice on how to act to promote or maintain good health, building a strong link between information, motivation and behaviour. It stays rather close to recommendations, adding a layer of fun and playfulness to make them appealing and achievable. Further, the exhibition directly addresses adults by pointing out how they can work to improve the health of the family. A number of signs encourage the adults to play with their children, take charge and change habits. For instance, a sign says: *Eating together can set up a great day for the whole family. Take time to make breakfast a habit at your house. BE A ROLE MODEL!*

The exhibition thus enacts a mode of learning that provides a hands-on exploration and experience of, how the building blocks of a healthy life can be combined – literally, by building healthy meals, and combining the different suggestions to healthy changes to suit people's needs

and everyday life. The suggestions are aiming to be small and achievable, so that a healthier lifestyle does not have to be a sacrifice or involve strict control, but rather requires moderation and balance. In sum, the exhibition provides a combination of information and recommendations with practical activities, that both advices for and against certain kinds of behaviour, provides alternatives, and frames health in an overall positive and playful manner that addresses both children and their adults. The exhibition enacts health as a functional matter, where the mechanics of a body that needs an energy balance is to be moderated by the mind that decides to take control and change habits. Bodies are performed as bodies that are meant to be active, but tend to be too passive in our modern-day environments. In this way, it carries strong characteristics of the mind-over matter approach. It performs health within a metabolic reality, where the key is balancing energy intake with energy output; consumption vs. expenditure.

The approach is clearly focused on enabling visitors to make the right health choices through information and the advice for moderation and balance. This approach implicitly assumes that by providing target groups with the right kind of knowledge, they will automatically make healthy choices. Employing Mol's argument that health advice enacts certain values and goods/bads, the exhibition's approach enacts physical activity as good, and inactivity, television-watching and excess consumption of the wrong kinds of foods, as bad. It enacts right ways of putting together your plate, right ways of balancing each meal, even right kinds of meals on specific times of the day. It addresses caregivers actively seeking tips and advice on how to 'do health right'. Consequently, there are certain, necessary conclusions that the audience needs to draw – about right and wrong kinds of behaviour. Its basic message is intended to be empowering: That you, by active choice and based on the information given, can change your lifestyle, and that it can be fun. By this, the exhibition veers towards a positivist learning approach; however, based on hands-on and bodily engagement, where families can play their way to the right conclusions about proper health behaviour. In this sense, the exhibition is predominantly based on the logic of choice. The direct addressing of visitors to take charge, be successful and know how to do the right thing, is a clear marker of a choice-based logic; however, mitigated by the concrete and playful exercises where visitors can try different variations of what is good and right. Thus, the health recommendations come in different variations that aim to make health more practically doable in the everyday.

Healthyville: "Your health is up to YOU"

Healthyville is an exhibition designed by the Stepping Stones Museum for Children, which, at the time of visit, was on loan to Long Island Children's Museum. It is built to mimic a city, with a grocery shop, a library, a doctor's clinic, a dentist, and other familiar settings. Each of the exhibits represents health-related situations emphasizing different aspects of health. For instance, in the grocery shop, visitors can shop for different vegetables and choose between large cards depicting different foods, scan them and see how healthy they are. There is information about how to read declarations, about allergens and nutrients, and the effect of sugar, fat and salt intake on the body. In the dental clinic, visitors can read about the patient records of the personas inhabiting the city. For instance Ella, who often eats sugary snacks during the day and does not like to brush her teeth. Consequently, the dentist instructs Ella's parents to make sure her teeth are brushed more frequently, and to help her choose more healthy snacks and limit sugar intakes. In the doctor's consultation, the visitors can familiarize themselves with medical instruments, see pictures of a teddy bear at the doctor, and read about germs, how they spread, and how to avoid contagion by washing hands frequently, and cover the nose when sneezing. An exhibit focuses on physical activity and play, and the importance of stretching to avoid injures, and to avoid playing when injured. Safety is emphasized with advice on remembering to hydrate, rest, and using safety equipment such as helmet, seat belt, safety west and so on.

All exhibits feature texts with tips for parents and caregivers on how to incorporate healthy habits in everyday life, such as serving fruit and vegetables at every meal. The exhibition has plaques with slogans such as *The choice is yours*, *Your health is up to YOU. Eat Smart. Move More. Live Well*, and *Be smart. Exercise your heart.*

38 The Healthyville personas from Stepping Stones Museum for Children

The notion of health in the exhibition encompasses more than physical activity and nutrition, including hygiene, safety and prevention of both communicable and non-communicable (lifestyle) diseases. However, with a focus on risk, adverse effects of behaviour and lifestyle, and advice on how to avoid and prevent undesirable conditions, the exhibition is arguably approaching a medicalized, clinically-focused approach to health, recounting the medical consequences of 'wrong' lifestyles. In this respect, it enacts a world of risks and dangers that you should be aware of, and try to avoid. It enacts an audience of caregivers who should exert responsible choices and be conscious of the effects of family habits. As such, the exhibit implicitly assumes that you do not live healthily enough; that you need to exercise more, and be more aware of what you eat. Like KidPower, and most other kinds of health advice, Healthyville makes health a matter of informed choice, here introduced in a concrete and playful form via roleplay and personas, appealing to both children and their caregivers. Eventually, by providing visitors with the right tools to navigate their environments, and the very direct message that your health is up to YOU, the exhibition enacts a clear logic of choice.

However, the engagement with the small steps in the everyday, the suggestions and practical advice to parents and caregivers about doable changes and how to make healthy options appealing, enact a more care-based logic, where it is considered what might be possible to implement with children, accounting for tastes and staying close to practicalities in the everyday. The environment created by the exhibition is nuanced and vivid; accommodating that there

might be difficulties and challenges in incorporating health into the everyday. The exhibition thus oscillates between the logic of choice and the logic of care, presenting health in both narrow and broad terms, both engaging with practicalities and communicating general advice and recommendations.

You! The experience: "A conversation with YOU, about YOU!"

At the Chicago Museum of Science and Industry, the sizable health exhibition "You! The Experience", presents exhibits about 'your beginning', 'your future', your body',' your movement', 'your mind', and 'your vitality' to encompass a broad array of aspects of life, health and wellbeing. In line with this, the homepage states that:

> *More than just a body, you are a complex blend of your experiences, choices, personality and environment.*
> *Who you are is also shaped by how you care for yourself and choose to enjoy life. Your mind, body and spirit have a vital connection, one you can use to improve your overall sense of well-being. The potential for greater health and vitality is within you … it's only a conversation away. A conversation with yourself.*
> https://www.msichicago.org/explore/whats-here/exhibits/you-the-experience/

The quote captures the exhibition's dual focus on the individual possibilities and preferences for action and lifestyle, and the structural and environmental conditions that influence health and well-being. The exhibition approaches health and well-being from a very broad perspective, including bodily functions, the relation between lifestyle and disease and aging processes, capturing biological, social and mental dimensions of health. The approach is, as indicated by the direct addressing of YOU in the homepage quote and in the exhibition texts, directed at the individual to reflect and decide on his/her own goals and actions. The exhibition states, that: "*Your future doesn't just happen. You create it – and continually reshape it through the choices you make and the life you live".*

Here, the exhibition clearly enacts the logic of choice. However, elsewhere, as in the quote above about the complex factors interacting to shape people's health, the exhibition also demonstrates that the possibilities for changing one's health depend on more than one's own choices and wishes. And it provides the means for visitors to engage with their current health status, understand their lifestyle better, and judge whether they already live healthily. As such, it

does not automatically presume that the visitors live unhealthily, but provides the opportunity to gauge, compared to others, whether they could need a change of lifestyle. The exhibits provide personalized information and discussions, such as typing one's lifestyle (smoking, alcohol consumption, children and social status, etc.), to see an image of oneself at old age. Visitors can register their food intake and see a visual of their diet compared to all other visitors projected on a big screen.

By providing examples of peoples with long lifespans, and descriptions of their lifestyles, an exhibition extracts common features that contribute to long lifespans:

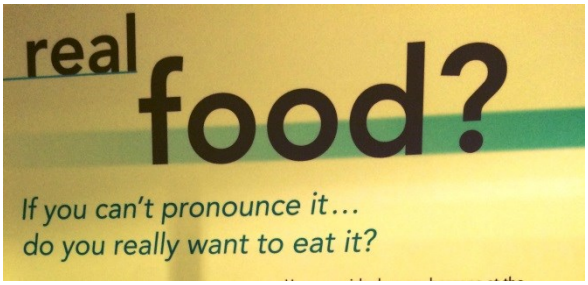
Don't smoke
Put family first
Be active every day
Keep socially engaged
Eat fruits, vegetables and whole grain

An exhibit depicts different aids for disabled persons to do exercise, and personal stories about people who, despite disabilities and disease, have managed to be active, alongside

overweight children who have become active. The exhibit invites you to choose your game; promising that there is a kind of exercise for any kind of person, and that "*The secret to an active lifestyle is not in your body, it's in your mind."*

The exhibition addresses the visitors as potentially competent and empowered actors, who need to scrutinize their behaviour, discover their health preferences, define their goals, and pursue them. Thus, health becomes closely related to self-fulfilment and working towards making your life the best possible. The message is that everybody can find a way of living more healthily – therefore, so can you. The exhibition thus presents health as a matter of informed choice. Importantly, it is coupled with the notion of fun and motivation; based on the assumption that it is possible for everyone to find aspects of healthy living and exercise that spur enjoyment.

However, the exhibition also puts focus on the structural factors of health that challenge the individual's action possibilities. An exhibit depicts 'the food desert', by showing how neighbourhoods in the Chicago area have very different access to healthy food, farmers' markets and community gardens, making it significantly harder for those living far from the healthy options to change their lifestyle. The exhibition depicts the growth in portion sizes and average calorie intake, the increase of additives in foodstuffs and the inscrutability of declarations.



With this exhibit, the museum underlines that people's possibilities and options are limited by infrastructure and geography determining the availability of foods, alongside the development of the food industry and farming methods. By showing how health is determined both by factors beyond individual control, and at the same time partially shaped by actions and choices, the exhibition creates a distributed responsibility for health. Here, 'the bads' enacted are not only bad habits and lack of knowledge, but the social structures that make it hard to live healthily. The exhibition is not, however, able to provide help as to how the visitors can overcome the structural barriers to health, only increase awareness about their existence.

The overall impression left by the exhibition is that despite the environmental and genetic factors, your lifestyle choices influence whether you reach the potential determined by your genes. The right mindset, mindfulness, conscious actions, and informed choices can counter the structural factors. The exhibition offers to assist you in realising your potential to be a better, healthier version of yourself.

Health-promoting exhibitions: the dilemmas

All of the exhibitions provide hands-on based health education that enables the visitors to experience health in a playful and easily accessible manner. In that sense, the exhibitions are able to provide that more welcoming and everyday environment which is sought for in health promotion. The learning situations they stage are based on collaboration, social experiences and predominantly positive notions of health. On the other hand, they also present some dilemmas and paradoxes by way of their health education approaches. They all produce ontological norms and enact right and wrong ways of doing health. In other words: their health education, albeit commendable, produces certain side-effects; side-effects that are familiar within health promotion, and are subject to continuous discussion within the discipline.

Positive notions of health

As mentioned introductorily, one of the challenges of health education is to engage different target groups and present health in a positive manner that is relevant to the target groups in question. The health-promoting exhibitions presented and analysed here all seek to unite health messages with a positive and playful museum experience, where interactives and bodily immersion are combined with factual information to motivate and inspire to live more healthy lifestyles.

The exhibitions offer visitors the opportunity to learn about health in positive, playful, hands-on ways that are adjustable according to competences and interest. The audience can largely navigate and choose the activities that interest them, and can sort through different levels of texts to obtain factual information to the degree that suits them. The museums are able to deliver health education in various ways that can appeal to different learning styles.

In terms of making the health messages achievable, the exhibitions present suggestions as to how you can make small and feasible changes, and they aim at presenting health as positive, connected to well-being, good living and personal sufficiency. The exhibitions seek to

raise awareness of factors that affect health, good and bad, and what you can do to change it, which is consistent with the aim of health promotion to create health awareness and knowledge. They provide opportunities for uniting bodily and social learning experiences, by combining factual knowledge with playfulness and the opportunity to learn by doing, and relating personal experiences to others'.

However, interspersed with the positive health messages are often messages about risk and the effects of unhealthy lifestyle. The exhibitions tend to vacillate between the positive messages and risk communication. This tendency is familiar within health promotion: it can be hard to define and describe health without referring to disease (Otto, 2008), or to give health advice without defining what *not* to do. The museum setting and the playful approach largely mitigate this, but not entirely.

Informed health choices and mind over matter

As described, the health-promoting exhibitions tend to frame healthy living as a mind-over-matter issue; suggesting that by conscious, informed choices, the mind can overrule bodily, unhealthy inclinations. They all aim at raising awareness of your responsibilities and possibilities for action. This is emphasized by the exhibitions' common use of exclamation marks, capital letters and a direct addressing of a "you", that is to respond and react to the information and experience provided. The exhibitions express that to be healthy is to be powerful, to have control over your body, by making the right choices. They enact a clear logic of choice, making each member of the audience personally responsible for their health. Furthermore, the articulation of physical activity as power creates an association between health and strength and empowerment, and health as success. This in turns also implies that lack of control over the body is the lack of success. The risk is to raise awareness and induce guilt, without enabling target groups to actually change any of the factors that influence their health.

Everyday life is complex and shaped by many different and entangled values, agendas and practices that might not enable the target groups to change behaviour. It is a well-known fact within health promotion that information alone rarely leads to behavioural change. Therefore, motivational and educational work needs to be accompanied by practical and policy changes (Jensen, 1997; Jespersen et al., 2013). The exhibitions thus articulate a fundamental conundrum: on the one hand, it is necessary to provide the target groups with the necessary knowledge and a sense of ability and competence to change. On the other hand, the consequence is, that by

placing the responsibility for health on the target groups in the hands of the target groups, they are also made responsible for their unhealthy lifestyle or any health conditions related hereto.

There are structural and political dimensions of health that are out of reach of the target groups but largely shape possibilities for action. The exhibitions acknowledge and explain how some health aspects are out of individual control, yet still focus on motivating the visitors to strive towards a healthier lifestyle, and to be aware of the consequences of their health behaviour. One exhibition (You! The experience) deals with this more than the others, and turns good healthy into the ability to cope with existing challenges.

A well-known critique of the 'informed choice' approach within healthcare is that it produces a neoliberal subject, who is informed about the harmful effects of certain lifestyle choices, and makes rational choices based on this knowledge, by weighing risks and benefits, and acting hereafter (Vallgårda, 2005). By this approach, improving public health mainly becomes a question of providing the right kind of knowledge and motivation, and the responsible subjects will thereafter modify their behaviour. Health thus becomes '*something 'chosen', a sign of strength of rational will, underpinned by good moral attitudes*' (Karlsen and Villadsen, 2016, 13). Structurally and socially oriented approaches within the studies of health are working to create wider recognition of the social and structural conditions making health more than a matter of knowledge and choice and pointing to the many matters outside of the individual's control that influence health and lifestyle. The exhibitions to some extent tend to support the widespread, neoliberal notion of the individual as a free and moral agent, who 'chooses' her own health.

The exhibitions can arguably only point to the structural problems and create awareness about how they influence your health. They cannot solve these issues or provide the care and support that is often needed in the long and complicated haul of lifestyle change, with all the collective and practical challenges that are implied, not only for the person in question, but for their relations and surroundings as well, as these all interact to shape how everyday life is lived. Of course, this does not mean that health education endeavours should be abandoned, but, rather, that information cannot stand alone, and that efforts that seek to influence structural barriers and policy are needed to enable changes in life conditions and opportunities to support lifestyle and attitude changes.

The museum as health communicator: authority or dialogue?

There is, we propose, an inherent tension between the ambition to foster dialogue and open-ended learning processes, and the dissemination of health messages and facts. Despite the focus on a broad and positive notion of health, the ultimate goal of health promotion is to create good lives by reducing the risk of disease, through the reduction of risk factors for health. These include the prevention of certain kinds of behaviour, i.e. sedentary lifestyle or eating an unbalanced diet. In engaging with health recommendations and their implied agenda, museums act as authorities, providing health advice and guidance on how to live better and more healthily through pre-defined notions of health. In most cases, the exhibitions soften the normative distinctions between 'good' and 'bad', by emphasising moderation and balance, so that 'unhealthy' habits are acceptable in moderation. The exhibitions define and delineate specific notions of health and set specific health goals in order to discuss how these can be implemented in the everyday life. They represent positive notions of health, but most often defined as the traditional aspects of health; diet, exercise, hygiene and disease prevention. The questions that the museums want to engage their visitors in relate to *how* the predefined health targets can be achieved, rather than questioning and discussing health recommendations themselves, their relevance and achievability, i.e. discussing health as a socio-scientific issue. This is somewhat in contrast to the recent turn within the museum world, as described in the introduction, articulating museums as public fora and sites for the discussion of critical issues, where ethical dilemmas, citizenship and social problems are addressed by engaging in open and critical dialogue. The steering of audiences in a certain direction, as also suggested in the initial quote by Roland, suggests a different role for the museum. The health-promoting exhibitions seem to be based on a more positivist learning approach, where audiences are to be recipients of health messages, rather than being invited to engage in a discussion of definitions and values of health. The museums position themselves not as partners in dialogue, but as the knowledgeable authority that initiates and shapes certain kinds of learning. This warrants consideration in a time of redefining and discussing the present and future social and societal roles of museums: how can museums best employ their undeniable social and educational influence?

Concluding remarks: the difficult issue of health

We have analysed and discussed the three health promoting exhibitions in an approach based on notions from Annemarie Mol, suggesting that this approach can be used to analyse exhibitions for their ontological norms and the realities they enact. Our analyses show that the presentations

of health in the exhibitions enact specific kinds of behaviour and mind-set as desirable. They are based on, and produce ontological norms and right and wrong kinds of behaviour, values and attitudes. They produce specific configurations of the users, specific subjectivities and distributions of responsibility. We have described how the health-promoting exhibitions provide hands-on, positive health messages and encompass different notions of health. The exhibitions present health in positive and experience-based learning frameworks where health is associated with playfulness, empowerment and success. They thus achieve the goal of enacting less medicalised and more everyday notions of health, which are probably more appealing to a wider audience, and easier to relate to than general health campaigns and medical health facts. They introduce health as more than medicalised reality, by focusing on small steps and everyday tweaks that are in line with health promotion approaches to make health attainable for people of different competence levels. Thereby, they build on a care-based logic, where engaging with the practical challenges of everyday situations provide a situated approach for making doable adjustments in the everyday. However, at the same time they enact the logic of choice with strong, empowering messages and the direct invocation of responsible health subjects to take action and responsibility of their own health. They also produce correct answers and certain kinds of learnings and realizations that the visitors should achieve, which are assumed will lead to healthy changes. They thus make health a matter of making the right decisions based on the knowledge provided by the museum. In the vacillation between a logic of choice and a logic of care, the logic of choice comes out as the strongest message, which is not surprising, as it provides a clear learning point and an empowering take-home message, which the museums need to provide for their audiences. The logic of care requires a much more subtle and situated approach, which is not easy to transform into clear learning messages and advice to take home. The goals of the exhibitions are laudable from a health promotion perspective. After all, health is a pressing, global concern, and the endeavours to improve population health are important. However, it seems that the health education in this context tends to take an authoritative turn, requiring that the target groups adopt specific skills and values and work towards a predefined goal: the implementation of healthy lifestyle changes.

With the health advice presented in the exhibitions, their explicit addressing of the visitors ("Your health is up to YOU"), and formulations of health as 'power', the museums act as authorities; proscribing actions and steering in specific directions. They thus define good lives in a specific manner, and they assume that by providing knowledge, visitors will work to

accomplish the goals the museums have defined. Hereby, we contend, the museums steer towards the original positivist learning paradigm, and a role as authority, instead of a forum where audiences can participate on equal terms in discussions of socio-scientific issues and be co-creators of knowledge. Instead of acting as fora for critical discussions of what health means in the everyday, or debating issues of power, politics and money within present health trends and discourses, in their promotion of health the museums align themselves with the agendas of health authorities; affirming and repeating their health messages.The turn to health in museums seems to enact a knowledge deficit similar to the original museums, rather than providing open-ended learning and meaning-making that accommodates the different social situations that are at stake in the everyday lives of visitors.

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Authors' contributions

All authors jointly planned and designed the paper, the study and the design. Julie Bønnelycke planned and conducted the fieldwork, analysed the data, made the analytical and theoretical framework for the article and wrote the final versions of the article. Dan Grabowski, Julie

Hellesøe Christensen and Peter Bentsen wrote the first drafts of the article and contributed with reading and commenting of the final versions. Astrid Pernille Jespersen contributed with analytical discussions and readings and comments of drafts and final versions. All authors read, commented and approved the final version.

Biographical notes

Julie Bønnelycke, MA in European Ethnology, Industrial PhD fellow at Steno Diabetes Center Copenhagen. Julie's PhD research focuses on museum-based health promotion developed through participation and co-design. Julie's research areas are everyday life, health promotion and science communication, public engagement and participation.

Peter Bentsen: MSc, PhD, Senior Researcher, Team Leader, Professor, Health Promotion Research, Steno Diabetes Center Copenhagen. Peter's research has generally focused on 'people, places, and pedagogies' in relation to health and education. Currently, his main research areas are health promotion and education with a focus on prevention and reduction of obesity and non-communicable diseases in a life course perspective, and development and evaluation of 'real-world' complex interventions.

Dan Grabowski, MA, PhD, Senior Researcher, Health Promotion Research, Steno Diabetes Center Copenhagen. Dan's research has focused on families, children and emerging adults in relation to health education and chronic illness management.

Julie H. Christensen, MSc, Industrial PhD student at GAME and University of Copenhagen. Julie's main research interests are intervention research and the health promotion potentials inherent in different everyday settings, with a particular interest in community settings.

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2.8 Concluding discussions

2.8.1 Summing up the thesis

In this thesis I have described the norms, realities and relations enacted in the development process PULSE. I have argued that PULSE enacted health promotion in a specific version, based on specific orderings and values originating from the in the project combined disciplines of health promotion and museum education. As I have recounted in the thesis, the process and challenges of PULSE shaped my empirical and analytical focus and led to the structuring of my thesis around significant moments of disconcertment and overspills that were produced by the project. These disconcertments and overspills led to my focus on the values, relations and positions of PULSE, and the examination of the phenomenon of health promoting museums and the health issues, target groups and 'solutions' they enact. The challenges that arose in PULSE, as I conceive them, originate from disciplinary challenges and paradoxes, which I have used PULSE as a prism to cast light on.

In **section 1** of the thesis I described the framing of PULSE within the disciplines of health promotion and museum education, and the values and aims that were shaped by the disciplinary trajectories and histories. These combined, I have argued, have fostered a specific kind of health promotion. The disconcertments that arose in the project are related to problematics caused, I argue, by the projectness of the project. In the political climate and financial structures surrounding research, innovation and health promotion, there is an orientation towards specific, pre-defined, measurable and market-oriented outcomes (Langstrup, 2011). In such projects, promises and expectations are embedded in the project goals, and the actors of the project are required to produce what the project aims for (Langstrup, 2011). Particularly health interventions tend to carry a specific kind of logic when defining the problem space of new projects: Often it is the political context and pre-existing knowledge and experiences from similar interventions, that shape how the problem of an intervention is defined and performed, rather than the actual, specific situation of the project in question (Dragsted et al, 2011). The logic of the projectness from the beginning contains certain enactments of the prospected users; they are through the project logic offered certain identities connected to problematizations and promised solutions of their health status (Ertner, 2015; Langstrup, 2011; Lassen, Bønnelycke, & Otto, 2015). PULSE, as most other health promoting endeavours, was organized in a specific project form; a certain way of organizing action, with specific goals, timeframe, management structure, and success

criteria. As I have described in my story of the process of becoming of PULSE throughout this dissertation, the project was from before its beginning shaped and defined by political, financial and disciplinary considerations: Specific values (health promotion and educational) and the trajectories of the participating institutions (their navigation in the world of fundraising, future strategies and visions), alongside the professional rationales and personal stories that were entangled in the production of PULSE, resulted in a very specific outcome through the long and troublesome processes of negotiating, aligning and making meaning of numerous different input and agendas. The modes of participation, kinds of expertise, relations, subjectivities and enactments of health enabled PULSE were therefore determined by strategical (financial, political, disciplinary) considerations. PULSE thus established certain parameters for, how health promotion in a science centre setting could be conducted. The framework that was set for PULSE drew on two disciplines who had related challenges, and complex and ambivalent driving logics. The challenges in PULSE manifest a foundational tension in the participatory and the health promotional approach; a tension which can also be found in the oscillation between authoritative and open-ended and dialogic learning within museum education.

In **section 2** of the thesis I have described how the development process was carried out in practice. I have recounted the development process of PULSE, and the efforts to promote health and inclusion through participatory design. I have done so with a point of departure in a series of moments of disconcertment, which, I have argued, pertain to some larger-scale problematics which I address in the four articles of the thesis. The articles engage with different aspects of a related set of problems, each concerned with different methods, different parts of the PULSE processes, and different empirical cuts. Together they point to fundamental challenges and dilemmas in the premises for conducting museum-based health promotion.

Article 1: ***Household Collectives, Resituating health promotion and physical activity***, submitted to *Sociology of Health and Illness,* engaged in a discussion of the conceptualization of the target groups for health promotion, based on the fieldwork amongst families that were intended as target groups for PULSE. Here we introduced the notion of household collectives as a target unit for health promotion, suggesting that, instead of addressing individuals and providing (more) health knowledge, health promotion needs to engage with the practical management of collectives in the everyday life. This was based on the experiences from the fieldwork with the PULSE families, where the entanglement and management of conflicting family practices was often the greatest barrier to increasing physical activity.

Article 2: ***'Well, they kind of participated in a different way'. Modes of participation at the Science Centre*** was based on the process of developing activities for and with the underserved users, and discussed the challenges of reaching out and creating formats for participation that accommodate practices and ways of being a visitor that are unfamiliar to the science centre, thus challenging our perceptions of good outcomes and how to value different practices and ways of using the science centre. I suggested that the participatory experiences designed in PULSE, including the exhibition, afforded certain *modes of participating*; of relating and interacting, and consequently, being part of certain socio-material performances, and that the participatory paradigm tends to harbour a bias towards formalized participatory formats, requiring certain skill sets and performances of citizenliness that are not necessarily available to less participation-familiar target groups.

Article 3: ***Codesigning health promotion at the science centre: Distributing expertise and granting modes of participation***, published in *CoDesign*, was based on the codesign process of PULSE, and in it we described how, rather than constituting all participants as equal contributors to the design process, the codesign process made certain kinds of input and participation usable and doable at certain stages. The process revealed that the participatory process had implicit scripts and that the professional roles of the project members created specific frames for which kinds of user contributions were valuable. Thus the codesign process was highly shaped by the different professional practices and rationales, and the development process was subject to negotiations and alignments between professionals which shaped how the everyday life of the participants was being activated in the design process.

Article 4*: Health education at museums and science centres: Health, fun and ontonorms*

Based on the analysis of three health promoting exhibitions, we described how the museum with health promoting exhibitions tends to oscillate between a constructivist and a positivist learning paradigm, where the framework encourages playful, dialogic, and social learning processes, but with a certain range of 'correct answers' and learning messages. The health education presented tends to take an authoritative turn, requiring that the target groups adopt specific skills and values and work towards a predefined goal: the implementation of healthy lifestyle changes. They do not leave much room for discussing the meaning of health in the everyday, or the values and definitions of health in a given context, which is in contrast with the ambitions of museums (and science centres in particular) to serve as fora for discussion and critical meaning-making. Furthermore, we argued that the definition and communication of 'health' and lifestyle changes implies the production of ontological norms and the definition of good and bad behaviours, thus

defining desirable ways of being a health subject. Thus the health-promoting exhibitions are not value-neutral, but based on, and producing, ontological norms and right and wrong kinds of behaviour, values and attitudes. With this line of thinking – health promoting agenda or no – I argue that we can dismantle the idea of museums being value neutral fora for the discussion of socio-scientific issues, as was described as a vision for the 21st century museums.

2.8.2 Museums and health promotion: four central themes

The double cultural analysis I have conducted in this thesis – an analysis *in and of* the project – has been structured around a series of disconcertments, focusing on the overspills and realities produced by the project. Writing the thesis I could gradually cluster the moments of disconcertment around four central issues, all pertaining to how and why the health promotion enacted in PULSE was shaped the way it was. The four themes are my unravelling of these processes, studying their compositions and the dilemmas they encountered, negotiated and solved in a certain way. They are composed of the insights and discussions from the articles and the chapters of this dissertation, and represent, I believe, the most significant dilemmas and challenges of museums' engagement with health promotion:

- Enacting 'the right' health problems
- Addressing the complexities of everyday life
- Scripting participation
- The role of the health promoting museum: Authority or forum?

2.8.2.1 Enacting the 'right' health problems

PULSE was imbued with institutional values and epistemological traditions that struggled with the unpredictability, ambiguity and complexity of the participatory process. There was a significant challenge in the uncertainty of the process of co-design and user involvement, which tended to conflict with the science centre's need for certainty, clear deadlines and a tightly planned development processes (see also Morse, Macpherson, & Robinson, 2013). Furthermore, PULSE was not able to accommodate health issues and practices that did not fit into the predefined values and aims of the project. The participation of the target groups was therefore limited to certain kinds of input, in certain parts of the process, under certain conditions. Not all kinds of input or modes of participation were equally valued. Those that were doable in the light of the particular project constellation were transposed into exhibition design. This was mostly based on the challenges and input of the Hellerup families, i.e. the socio-economically

advantaged and museum-familiar users. Working with the two different target groups, we were dealing with very different problem complexes, involving very different health practices and challenges, and different enactments of everyday family and community life. In Husum, the residents had other and more prevalent issues, which might be mitigated by increased physical activity; however, the way the project enacted expertise, participation and health awareness did not resonate with the family and local practices in Husum. Thus the predefined issue did not correspond with the problematics the Husum families were dealing with in the everyday life. The challenges of the Husum families were not doable problems within the project framework of PULSE. The framework of the project was set in a way that did not enable an engagement with the problems that were articulated in the fieldwork and the participatory process. This pointed to a profound dilemma within such participatory health projects: Of not being able to address the effects they produce, but having to put them aside because they are not doable, i.e. fitting into the ethos and institutional and disciplinary setting of the project.

2.8.2.2 Addressing the complexities of everyday life: collectives and practices

The problematization of sedentary behaviour that the project enacted fell on very fertile ground with the Hellerup families. They were already attuned to health as a matter of concern enacted in the way that PULSE did. However, they were not in need of health education, but rather a practical engagement with their collective and complex everyday practices and the juggling of many demands, ideals and tasks. My fieldwork amongst the families pointed to health as a collective matter and emphasized the everyday struggles to balance practices of health and family life, thus pointing to a mismatch between the everyday efforts to deal with health as a practical issue, and the venture to promote health in ways that are more fun, appealing or accessible. The fieldwork showed that the barrier for change was not so much lack of knowledge, but rather the practical arrangement and managing of practicalities in collectives. I have therefore suggested to make collectives the target for situated interventions based on tinkering and the practical management of household roles, tasks and dynamics. The PULSE exhibition consequently offered a practical and playful engagement with everyday scenes and settings to infuse more pleasurable, collective and social activity into everyday lives.

2.8.2.3 Scripted participation

A recurring theme in the moments of disconcertment I experienced in the project was the notion of participation, which frequently caused the co-existing expectations, values and rationales of participation in the project to clash. The challenges we encountered in the process to me raised questions about the participatory agenda, the kind of health promotion enacted in the project, and the inclusion of the underserved users. Based on a performative approach I have asserted that health, participation and participants are co-enacted in the participatory health promotion process. I have argued that the framework of PULSE was shaped by a participatory paradigm which tended to favour certain forms of participation and recognize certain positions and subjectivities. In **Part 2,** I recounted how the project at an early stage encountered problems in recruiting and involving the underserved users in the development process. The project's initial approach primarily succeeded in recruiting participants who were already interested in health and the science centre institution. This led me to argue that the way we in PULSE initially articulated the prospective participants, performed certain desired competences and motivations for participation that resonated with the museum-familiar audiences, but served to further marginalize the underserved users. The efforts to promote inclusion and participation in PULSE thus produced an ideal figure of the participating subject, who was a well-articulated, disciplined and competent co-producer of design. The participatory processes that were envisaged to increase inclusion, instead excluded some, and created certain distributions of expertise and valued certain kinds of input. The different participatory events staged in PULSE afforded different modes of participation: Overt and formalized; community-oriented and subtle; and chaotic and unscripted. These different modes of participation accommodated different practices of community, family life, care and responsibility, and require different competences – thus some modes of participation, I contend, are better suited for underserved users than others. The formalized and overt approaches to participation were suitable for the museum-familiar audiences; Hellerup-families, but less so for the disadvantaged groups. These formats for participation did not accommodate the diverse practices of enacting health, citizenship and participation in the everyday lives of the underserved users. Rather, participation emerged in unexpected situations, in processes that could not be planned ahead or maybe even be seen or valued through the lens of formal participation. The activities that did work were situated, and unscripted, building on existing social dynamics rather than disrupting them. Thus the Xbus-event enabled a community-oriented way of participating that was unexpected, informal and sometimes hard to fit into existing frameworks and perceptions of 'good visitorship'.

2.8.2.4 Museums as health promoting actors: authority or forum?

In this thesis I have discussed the *effects* of health promoting exhibitions; this burgeoning genre that the PULSE Plaza is a case of. By effects I do not mean impact or outcomes, but the effects in terms of the relations, realities and norms enacted by the health promoting museums. As I approached in section 1.3, museums take on very different roles in their efforts to find a position in society, keeping up with societal changes, and the ever-changing demands and expectations they face. Museums have to generate income, satisfy existing audience groups and generate new ones, to attract funding and justify their existence (Kotler and Kotler, 2001). One such strategy is to pursue matters that attract funders and politicians – such as health (by this statement I do not wish to dismiss the altruistic incentives that are undoubtedly also part of the motivations for promoting health, but merely point to the fact that museums are struggling for survival, and must continuously secure their own means of existence). Each exhibition is thus heavy with agendas and intentions, the result of processes of gauging political currents, performing fund-raising, procuring objects or designing exhibitions, curating, and much more. The political and financial considerations and lengthy creative and strategic negotiations that are part of the process of becoming of an exhibition are largely invisible to the public, once the exhibition is finalized and opened. To employ a familiar notion within ANT; the final exhibition has become a black box; a finalized result that does not disclose the numerous considerations, insecurities and negotiations that came before. It is a product of specific scientific, didactic and designerly methods, ontologies and epistemologies. In light of this, the strategies, choices and negotiations that led to the development of a specific exhibition, and the way an issue or a phenomenon is enacted in and by this exhibition, are very important. They determine how an issue becomes enacted as a matter of concern (Latour, 2004). They shape how and which phenomena are made public. And once they are solidified in an exhibition, they have taken a certain shape, enacting a version of reality – one version out of many possible ones, which are largely made invisible and absent, by the presence of the finalized version exhibited (Law, 2004). This has profound effects, both for the phenomenon or issue enacted, alongside the collateral enactments that are taking place: Enactments of norms, visitors and relations. In my conceptualization, the science centre-based health promotion endeavour, such as PULSE, enacts certain realities, and has certain ontological effects: It produces collateral realities and ontonorms with the unintended consequence of excluding some kinds of audiences, some modes of participations, and some health issues. Inadvertently the project thus works against its participatory and inclusive aims: Certain kinds of knowledge, certain forms of participation and certain kinds of visitors are favoured. The notion

of participation, collaborative design and open-ended meaning making are in this context delimited and shaped by the disciplinary, institutional and political embedding of the project.

There is an overt interventionist agenda connected with the aim of performing health promotion, where museums declare their intentions to influence and change behaviours by specific measures. By repeating the health messages and formats of other health actors, such as governmental institutions, the museums serve to reinforce these messages, stabilizing and singularizing health in a certain way; defining right health practices, health subjects and modes of participating in the enactment and communication of health.
Conversely, the ambitions of museums to act as fora for discussion of socio-scientific issues and democratic processes, suggest another, more critical societal role for museums: To enable more open-ended engagements with health alongside other socio-scientific issues. I have aimed to raise awareness of the collateral realities and ontological norms enacted by museum communication, and suggest that museums can actively employ these notions to scrutinize their own practice for implicit normativities and inadvertent scripts, and use their reality-making abilities to engage with ontological politics, facilitating the crafting of different realities and matters of concern. By facilitating discussions and different modes of participation that engage with the practical, collective enactments of health in the everyday, museums can contribute to creating more situated and practice-oriented promotion of health as part of good everyday lives.

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Article 5: Museums and science centres for health: from scientific literacy to health promotion

Julie H. CHRISTENSEN*, Julie BØNNELYCKE, Lærke MYGIND & Peter BENTSEN
Steno Diabetes Center A/S, Steno Health Promotion Center, Niels Steensens Vej 8, Gentofte 2820, Denmark
Julie H. Christensen, Research Assistant: jlhc@steno.dk / + 45 30 20 28 16. Julie Bønnelycke, Ph.D fellow: jubq@steno.dk / +45 30 27 26 38. Lærke Mygind, Student Research Assistant: lmgr@steno.dk / +45 30 13 30 28. Peter Bentsen, Senior Researcher: pebt@steno.dk / +45 30 75 22 63.

** Corresponding author*

Abstract

This paper presents a scoping study of written material from 18 health promoting exhibitions at museums and science centres with the aim of assessing and discussing their design and purpose, underlying concept of health, as well as findings and evaluations. Based on the five action areas of the WHO Ottawa Charter for Health, we discuss the breadth of current health promoting exhibitions and ways of extending their reach and impact. Drawing on Nutbeam's health outcome framework, we consider the challenges inherent in museums taking a health promotion approach, particularly in relation to evaluation and assessment of health related outcomes, and suggest that broad health related outcomes should be evaluated to establish the effects on health of exhibitions. Lastly, we conclude that the health promotion potentials of exhibitions can be increased through building on a broader notion of health including empowerment and equity, and increasing community synergies.

Keywords
Children, exhibition, families, health education, learning, review

Introduction: museums and science centres as settings for health promotion

This paper presents a scoping study (Arksey and O'Malley 2005; Daudt et al. 2013; Levac et al. 2010) of 18 recent health exhibitions with the purpose of assessing and discussing the potential for health promotion based in museums and science centres *(footnote 1*). Since the 1960s, science centres and science museums have proliferated, characterised by their hands-on exhibits educating the public about science, technology and more recently, societal issues (Friedman 2007). Concurrently, the domain of health education has advanced from efforts to persuade people to change their behaviour by informing them about health-related issues towards empowerment-centred health education (Green and Tones 2010). The latter approach draws on a holistic concept of health, thereby broadening its scope from a narrow view of health as the absence of disease to a broader focus on positive health and wellbeing (Green and Tones 2010). Our study revealed an increasing interest in applying broad and positive conceptions of health in museum and science centre exhibitions in the past ten years. Lacking, however, is a systematic assessment of the purpose and effects of such exhibitions and thereby their contribution to the field of health promotion.

Science centres and science education

The purpose of early science centres was to educate the public about the progress of science and technology and promote scientific literacy, creating scientifically competent citizens and prompt scientific education (Bradburne 1998). In contrast, recent developments have focused on critical reflection on the potentials and pitfalls of scientific development as a crucial part of the new scientific literacy (Pedretti 2002). This approach emphasises the ability to debate critically the future of science; arming citizens to critically relate to, and distinguish, conflicting or complementary scientific statements and the constant flux of new scientific results; as well as to assess the relevance and validity of these. As such, science centres have increasingly focused on educating the public to become competent and critical citizens (Quistgaard and Kahr-Højland 2010; Pedretti 2002).

Simultaneously, science centre views of the visitor have changed from regarding them as passive recipients to acknowledging them as co-creators of knowledge (Hooper-Greenhill 2000). The visitor's active construction of knowledge is now seen as based on previous experience and socio-cultural background, as well as the context of the learning situation, raising a consciousness about the conditions and contingencies of learning within the museum field.

Science centres thereby continue their evolution from being authoritative communicators of scientific facts and evidence towards a more context sensitive and socially responsible role.

Health in the science centre context

In line with this paradigmatic shift, Pedretti (2002, 5) contended, "science museums are beginning to see themselves as important players in a number of external scientific, social, cultural and political contexts". This shift includes a broader view of the scope, purpose and relevant topics of science centres, as well as a more extensive conception of what constitutes science, resulting in issues-based exhibitions on socio-scientific topics (Pedretti 2004).

One emerging theme from this perspective is that of health exhibitions which do not only disseminate information about the body and its functions but in addition aim to affect visitors' lifestyle. While expositions about the human body and its physiology have been on display since the late 19th century, educating the public about their bodily functions and health (McLeary and Toon 2012), exhibitions that actively promote healthy lifestyle change are a relatively new phenomenon. Health promotion calls for a broad, multifaceted endeavour in the settings of people's lives, ranging from the individual to community and structural levels (Green and Tones 2010).

The concept of health promotion is based on a broad notion of health as encompassing physical, social as well as mental health and wellbeing. Central to health promotion is the notion of enabling people to gain control over their life and health; empowering people, and a commitment to creating equity in health (Green and Tones 2010). Since the establishment of the field of health promotion with the seminal Ottawa Charter in 1986 (WHO 1986), a wide variety of settings have been studied in the field: communities, schools and work places (Green and Tones 2010), to name but a few. We hold that science centres and museums provide a new setting for health promotion and that they should be studied as such.

Studies of the health promoting potentials of (art) exhibitions have received a fair amount of attention (e.g. Camic and Chatterjee 2013; Hamilton et al. 2003), while our search indicated that studies regarding the outcomes of explicitly health related exhibitions and their potential for promoting health in this new setting are scarce. This finding concurs with Lewensteins (2011) contention that few peer-reviewed studies are published in the museum field and that grey literature is only beginning to become available to the wider public.

Therefore, this study examines health exhibitions with aims and ideals parallel to those of health promotion. Which approaches are taken to promote health through exhibitions? What

are the desired outcomes and are they achieved? We have a keen interest in exploring these questions as the results of this study will inform the development process of our own health promoting exhibition, PULSE. In order to review the literature in relation to health promoting exhibitions, we conducted a scoping study (Arksey and O'Malley 2005; Levac et al. 2010; Daudt et al. 2013) of grey literature about health promoting exhibitions with the purpose of reviewing an exemplary segment of current health exhibitions focusing on the design and aim; concepts of health; and health related outcomes of the exhibitions. This concludes in a discussion of the potentials and challenges for health promotion at science centres and museums.

Methods: a scoping study of health promoting exhibitions

The review is based on a literature search performed in the summer of 2012, with an updated search for new material from the already included exhibitions in spring 2014. It compiles a number of recent health exhibitions and health promoting programmes at European and American science centres, health museums and children's museums. Initially, several major databases were systematically searched for research papers about health promoting exhibitions and evaluations of these (see Figure 1). A broad search strategy was used, testing a wide range of search terms and combinations, and reference lists and cited-by functions were used in a snowballing attempt (Greenhalgh and Peacock 2005). Further, an individual search of relevant museum journals was conducted. The effort, however, provided limited results. Consequently, we carried out a scoping study (Arksey and O'Malley 2005; Levac et al. 2010; Daudt et al. 2013) of grey literature in order to review non-research material and identify knowledge gaps.

Scoping study methodology

The scoping study allows for a mapping and summarising of available material, including grey literature, and is particularly suitable in emerging research areas (Levac et al. 2010). We therefore consider this methodology suitable for our purpose of reviewing the available literature in relation to the relatively unexplored topic of health promoting exhibitions. As advised by Levac et al. (2010), our analysis consists of both a descriptive summary and a thematic content analysis, further described below. There is some debate of whether scoping studies should include a quality assessment of the reviewed literature (Arksey and O'Malley 2005; Daudt et al. 2013; Levac et al. 2010). Given the diversity of the included material, it has not been feasible to do a structured appraisal; however, we do consider the overall quality and suitability of the material in the Discussions section.

Museum search: material selection and inclusion criteria

As research publications on the subject proved scarce, we contacted relevant networks of science centres and museums requesting information or material on relevant exhibitions within the same time frame (see Figure 1). European and American museum organisations were contacted and their homepages searched in order to acquire material or contacts through snowballing techniques (Biernacki and Waldorf 1981). The acquired exhibition material, mainly consisting of non-scientific publications and internal reports, was sorted based on a number of inclusion criteria (Arksey and O'Malley 2005), see Figure 1.

Please insert Figure 1. Flow chart of search strategy around here.

Key concepts

The review considers exhibitions at *science centres, children's museums and science museums*, understood as institutions providing informal learning environments, lending itself to the ASTC (Association of Science-Technology Centers) definition as institutions teaching about science and technology, using hands-on dissemination, and supporting school curricula (ASTC homepage).

While exhibitions informing about the body and its functions may have health promoting effects as an indirect outcome of learning about for example normal versus pathological functions, exhibitions are included in the review only if they have a *pronounced ambition of promoting health*, making the intention to prompt behavioural or attitudinal change a key component in our inclusion criteria. We apply the WHO definition of health as stated in the Ottawa Charter (WHO 1986), which implies a holistic understanding of health as not merely the absence of disease but a positive conception of physical, mental and social wellbeing. Further, the process of enabling people to be in control of their life and health is central to health promotion in this definition.

Analytical framework and strategy

All included documents were read and analysed independently by two reviewers, as suggested by Levac et al. (2010), and subsequently discussed. The descriptive part of our results consists of a summary of the designs and aims of the health exhibitions as well as their target groups and

health focus, providing an overview of the exhibition context. Further details of the included studies are available in Table 1. Following Levac et al.'s (2010) suggestion, the included exhibitions were, in addition, subject to a qualitative, deductive content analysis (Elo and Kyngäs 2008) based on two theoretical frameworks, which were developed in an iterative process of reading empirical and theoretical material.

The first analytical theme concerns the approach and aims of each exhibition for promoting health, categorised according to the five action areas of the Ottawa Charter (WHO 1986) which comprise health promotion action, summed up as follows. 1) *Building healthy public policy* by putting health on the agenda of policy makers and enhancing health equity. 2) *Creating supportive environments* that foster healthy, enjoyable and stimulating conditions for making leisure and work a resource for health with mutual maintenance of social relations, communities and the environment. 3) *Strengthening community action* through strategic decisions and priorities; encouraging public participation to empower communities. This is done by drawing "on existing human and material resources in the community to enhance self-help and social support" (WHO 1986, 3). 4) *Developing personal and social skills* to enhance people's control of their lives and health and their coping abilities through information, education and improvement of competences. Finally, health promotion action works towards 5) *Reorienting health services* by endorsing collaborations between individuals, communities and health professionals beyond the clinical setting. The five action areas are central to the concept of health promotion as defined by the WHO and allow for an assessment of the extent and breadth of the exhibitions' health promotion efforts.

A second framework is applied in our analysis of the stated outcomes of the health exhibitions; namely, Nutbeam's (1998) three levels of health-related outcomes. First, and top of the hierarchy, are *health and social outcomes,* which refer to concrete improvements to health such as improved physical and mental health, quality of life, and equity; i.e. the end point of health promoting interventions. Second, evaluations may reveal *intermediate health outcomes*; increased control over the determinants of the above mentioned outcomes, e.g. improved healthy lifestyles and increased physical activity, and other determinants such as healthy environments and access to and use of health services. Finally*, health promotion outcomes* are the more immediate results of interventions; improved health knowledge and motivation, health literacy and ability to use information. This grouping permits a distinction between different levels of health-related outcomes, which is requisite to evaluate health promotion processes that do not

necessarily display evidence of traditional, direct health outcomes (Nutbeam 1998). Nutbeam related his framework to the five action areas, as displayed in Figure 2 (Nutbeam 1998, 30).

Please insert Figure 2. Nutbeam's (1998) framework of health related outcomes around here.

Methodological limitations and considerations

Our method of identifying material through contacting museums and organisations implies that the material is derived from those museums who responded to our approach; who were, further, in possession of written exhibition material or evaluations; and lastly were willing to share it. Consequently, it has not been feasible to conduct a thorough search of grey literature; rather, we have gathered exemplary material of current health exhibitions. While we review exhibitions that explicitly claim to be health related, implicit health promoting effects of museum visits go beyond what is covered in this study. The differing quality of the material provided a partial insight into the designs and evaluations of health promoting exhibitions of varying depth; however, it is the nature of scoping reviews to embrace new research fields with limited availability of literature.

Results: visitors, designs and concepts of health

Please insert Table 1. Overview of Health Exhibitions

The exhibitions vary in size from smaller exhibits in local museums to grand exhibitions within major science centres. Sizes range from Exhibition 18 [Ex.18, see table 1] consisting of three exhibit kiosks designed to travel to exhibition spaces as small as 300 sq. ft. to the 12,000 sq. ft. Ex.16. Further information about the exhibitions is available in Table 1. Of the 18 included exhibitions, only two are located outside the USA; in the UK [Ex.14] and Belgium [Ex.13], respectively. Limiting the included material to English language material narrows the field of available material, particularly when it comes to grey literature, which may thus partly explain the lack of material on health exhibitions in Europe.

The inclusion criteria established families with children as the target group of our literature search. Together, the included exhibitions cover the ages 0 to 17 years. Several museums apply strategies to cater for and attract diverse audiences. Exhibitions and related

programmes and materials are sometimes bi- or multilingual to accommodate local ethnic groups [Ex.7; Ex.10; Ex.17s]; are culturally sensitive [Ex.3]; or outreach efforts are made for the audience to reflect local demographics [Ex.11].

Exhibition designs and aims

Installations with untraditional ways of doing physical activity are widespread [e.g. Ex.15; Ex.16; 18], aiming to show children fun ways of being physically active. Often, stations are installed where children can try new ways of using their body and get active, for example climbing walls, interactive dance floors and hand pedalling bikes. A common purpose of these installations is to provide children with an opportunity to discover that physical activity is for everybody, often in a non-competitive environment. In general, the museums aim to make lifestyle changes accessible and manageable by encouraging small changes in everyday life that promote health.

Exhibit environments that invite pretend play in restaurant or kitchen settings are a popular way of teaching children about healthy nutrition [e.g. Ex.7; Ex.8; Ex.11]. Children can engage in 'cooking' healthy, varied meals from plastic foods and serve them to their parents. For example, Ex.11 encourages children to eat varied meals by teaching them to 'eat a rainbow' (i.e. fruits and vegetables in all colours). While the children cook, the seated adults can read nutritional information sheets with facts and tips, and talk about healthy eating habits with their children. Another message conveyed in several exhibitions is nutritional values of various food groups distinguished as green-, yellow-, and red light foods [Ex.12] or the American National Institutes of Health's *Go, Slow, Whoa!* message classifying healthy, moderately healthy and unhealthy food groups [Ex.16; Ex.18]. Ex.7 works with a similar 'sometimes versus anytime foods' distinction. In addition, several museums include elements about the body and its functions, for instance the digestive system [Ex.2; Ex.9], the brain [Ex.2] and how the body reacts to various stimuli and kinds of exertion [Ex.4].

A wide range of approaches are taken to extend the museum experience beyond the visit itself, with the intention that families incorporate healthy living messages into their daily lives after their experience at the museum. Some museums provide material to take home such as recipes, books, and activity sheets [e.g. Ex.3; Ex.5; Ex.7;], or teaching material including pedometers [5] or activity logs [Ex.5; Ex.14] for schools to borrow to encourage sustained activity, sometimes combined with rewards for achieved targets [Ex.14]. Online tools include

access to participants' results from the exhibition at home [Ex.2; Ex.4; Ex.13]; and additional activities online to try at home [Ex.4; Ex.14; Ex.17].

Health exhibits are often supplemented with various programmes and events; for instance games, health classes and walks [e.g.Ex.1; Ex.5; Ex.15].

Concepts of health: what is 'health' in health exhibitions?

The most common themes in the included exhibitions are physical activity and nutrition and eating habits, two key areas in combating childhood obesity. While all exhibitions cover either nutrition, physical activity or both, they are in most cases supplemented with other health related issues. In children's museums, dental health, hygiene, sun safety, and other topics that promote physical health are common (see Table 1). Further, these museums often have a general focus on enhancing children's cognitive development and wellbeing as an overall museum purpose. In science centre settings, knowledge about biological functions of the body and how they can be improved may be combined with measurements of the visitor's own body [e.g. Ex.4], or visitors are given the opportunity to test their cognitive skills [e.g. Ex.13]. Together, the exhibitions cover a wide range of health issues ranging from positive parenting, pregnancy health and teen development [Ex.16]; over asthma and allergies, sleep and stress, and child development [Ex.9]; to making visitors reflect on their own wellbeing and what makes them happy [Ex.13]. The approaches and assumptions underlying the exhibitions will be discussed in the following.

Discussions: science centres and museums as settings for health promotion

The five action areas: reviewing the reach of current health exhibitions

Please insert Table 2: analytical framework with results from analysis

In the following sections, we draw on the five action areas of the Ottawa Charter as an analytical framework to discuss the breadth of the action taken to promote health in the museum setting. The discussion is structured according to the prominence in the material of each action area, leading us to first discuss the most dominant category of action area 4; developing personal skills.

The classic experience: developing users' knowledge and competences *(action area 4)*

All included exhibitions aspire to develop their visitors' personal skills through health education, which may not be surprising as an aim of science centres is to increase visitors' knowledge and promote (scientific) literacy (Friedman 2010), while children's museums seek to support children's cognitive development through play (Edeiken 1992). In this way, science centres and museums may be considered clear-cut settings for promoting health. However, in the material different approaches to developing personal skills are used, with varying assumptions of both what skills are needed to change behaviour and what kinds of initiatives are necessary to achieve this objective. For instance, some exhibitions build on the assumption that knowledge leads to action and therefore provide information and scientific facts as a means for behaviour change, while another belief is that further support is needed for people to adopt lifestyle changes in their everyday lives; thus additional resources may be offered to support families in their home or in the community. The Ottawa Charter states the purpose of developing personal skills as supporting "personal and social development through providing information, education for health and enhancing life skills" (WHO 1986, 3), in other words, illustrating various degrees of empowerment and coping abilities. Likewise, the health exhibitions aim for different extents of health education. Exhibitions often aim to take into account the busy everyday lives of families with children and convey simple and clear messages in imaginative ways, with the purpose of providing accessible health education and simple strategies for adopting healthy behaviours. Some museums provide basic health education e.g. by informing about nutrition [Ex.11] or the human body and its functions, with an emphasis on how various lifestyles affect its functionality [e.g. Ex.4; Ex.5; Ex.10]; or by providing health advice. However, although knowledge is a prerequisite for adherence to health advice, knowledge alone rarely leads to behaviour change (Green and Tones 2010; Nutbeam 2000; Lindsay 2010). From a health promotion perspective healthy living is about more than individual intentions and behaviour (Jespersen et al. 2013). Attention to other important factors in achieving healthier lives, such as social practice and identities, is a prerequisite to succeed in facilitating change (Green and Tones 2010; Halkier 2011). This is an important observation as the intention of improving personal skills in the case of the included exhibitions is to initiate action. Thus, "health education can be a major driver within an empowerment model of health promotion" (Green and Tones 2010, 56); however, the effectiveness of health education depends on its degree, ranging from information through education to empowerment and support to facilitate change. The latter requires the development of a range of skills and resources related to literacy, decision-making, psycho-motor skills, *and* social relations. Some museums respond to this challenge by supplementing health information

with educational programmes to support learning through for example parent education and family programmes [Ex.17]; classes for teenagers related to STD prevention and babysitting [Ex.16]; and classes for visiting schools related to the exhibition [Ex.8]. Such initiatives strengthen empowerment if they build life skills and coping abilities in the attendants, as well as strengthening social support and networks. The change of health practices in everyday life is, furthermore, decisively influenced by the remaining action areas identified in the Ottawa Charter to which we now turn.

Community outreach: collaborations and synergies *(action area 3)*

A large part of the included exhibitions build on various community partnerships, both inbound collaborations at the museums and outreach activities in local communities. It is a widely used strategy to include local stakeholders in the development of exhibitions and content-related issues. Local community partners such as nutritionists, nurses and doctors can provide museum developers with specialised knowledge to include in the exhibition material, and may know needs and specific local conditions of the community, thereby helping developers address the most locally relevant issues and employ the most appropriate methods [Ex.12; Ex.18]. Partnerships can facilitate an alignment with the health goals of other community health organisations; potentially creating synergies between museums and other local initiatives. Such projects are in accordance with the Ottawa Charter call for communities to draw on existing resources in the community to enhance their influence on community health and wellbeing (WHO 1986).

Partnering with health professionals in the exhibition development may require negotiations and adjustments to align interests and agendas between collaborating partners. Partners may have different conceptions of which health challenges are most prominent, which can create the need to redefine exhibition themes and dissemination styles. Professionals may introduce health aspects outside the mainstream and thus expand conceptions of health [e.g.Ex.6]. Thus, to develop comprehensive health promoting exhibitions, it can be advantageous to include a diverse group of stakeholders. Partnerships can, furthermore, provide the opportunity to develop more extensive projects and events by providing funding and extra staff [Ex.9]. Local partners can also function as gatekeepers, and several museums emphasise the importance of being receptive to opportunities for including local stakeholders and volunteers in order to work towards the common goal of promoting health in the community [e.g. Ex.1].

Several outreach-oriented activities are aimed at enhancing the qualifications of community staff and volunteers. Museums thereby contribute to community development by taking responsibility for enhancing the collective resources of the community. Examples include Ex.2 which educates volunteer nurses, while Ex.5 identified teachers to participate in a workshop on nutrition and body systems in relation to physical education. Other museums invite local health services, organisations, and sports clubs to inform about and promote their services, thereby creating a space where at-risk families may feel more comfortable talking to professionals. Some museums offer health services as part of their events, e.g. by giving marginalised citizens the opportunity to register for free health insurance and dental care; or donating free bicycle helmets, tooth brushes etc. [Ex.1; Ex.9]. In this way, museums expand their field of interest from providing knowledge and skills to overcoming structural barriers to health such as economic ones.

Travelling exhibitions are in several instances aimed at disadvantaged communities or those outside the regular museum audience in an attempt to reach new target groups and those not usually searching for health advice. For instance, Ex.14 intentionally works towards taking their travelling exhibition to vulnerable communities and areas with severe health inequalities (ACM 2010), while Ex.5 provides museum-to-go classes similar to those available at the museum, to reach those who cannot afford to attend the museum itself. Hence, museums may prove a useful setting for reaching target groups that other organisations struggle to attract, or to focus on population groups that have been overlooked in other initiatives.

Broadening the scope: towards health promoting policy, environments and health services *(action areas 1, 2, 5)*

The remaining three aspects of health promotion action are less common in the material; however, we contend that targeting these areas holds potential for further developing health promotion in the museum setting. Firstly, efforts to create *healthy public policy* are scarce and modestly described. Ex.2 asserts that they put health on the agenda of policy makers by impacting nutrition policies at Head Start centres, while governmental levels may be reached through partnerships [Ex.1; Ex.9]. By affecting public policy through advocacy, agenda setting and establishing local partnerships at both micro and macro levels museums may contribute to community empowerment and the formation of healthy public policy.

Second, few initiatives actively work towards the broad agenda of *creating supportive environments*. Ex.1 strives to target both individual and social-environmental levels in their

community-oriented programmes e.g. by teaching environmental responsibility and knowledge of different cultures, which can arguably be a step towards creating supportive environmental and social surroundings. Focusing on health every day in the development and execution of an exhibition can make the workplace supportive to the health of employees if they adopt the messages they convey to others [e.g. Ex.12], or concrete measures are taken by installing bike racks and providing healthy food at meetings [e.g. Ex.11].While these outcomes are not the prime purpose of exhibition development, they are noteworthy considering the attention given within the field of health promotion to work places and creating settings for health. Hence, exhibitions can contribute to the Ottawa Charter goal that "work and leisure should be a source of health for people" (WHO 1986, 2).

Lastly, the Ottawa Charter suggests a *reorientation of health services* towards arenas outside the clinical setting and examples from our material illustrate that clinical staff do indeed take part in exhibition development e.g. by attending boards, allowing them to share their knowledge and affect priorities. This is one way to "open channels between the health sector and broader social, political, economic and physical environmental components" (WHO 1986, 3). More extensive collaborations were in place at Ex.16 and Ex.8 as both museums were sponsored partly by hospitals. Ex.16 label themselves 'the educational arm of the Memorial Children's hospital' (Ex.16 homepage) and the museum was established by local health services and a health foundation, providing an example of an innovative approach to reaching local children with health messages and programmes. Health services thereby advance a health promoting agenda rather than a purely curative one.

Health related outcomes: challenges and possibilities in evaluation

In order to establish what outcomes have been reported from these diverse efforts at promoting health, we now turn to evaluations of the exhibitions. Nutbeam's (1998) framework distinguished between three levels of health related outcomes; *health promotion outcomes*, *intermediate outcomes*, and *health and social outcomes* (see Figure 2). The framework is used to judge the outcomes of the exhibitions, if such are stated. Structured evaluations were scarce in our material, and those available were often focused on traditional visitor study themes related to the use of each exhibit element such as number of visits and time spent; as well as qualitative assessments of their quality; or overall ratings of the exhibitions. While there is no doubt of the usefulness of such evaluations for exhibition development and assessment, they do not provide insight into their potential health related outcomes.

Evaluations of *health promotion outcomes* (Nutbeam 1998) are the most common health-related results presented, especially evaluations of whether people learned something and if they intend to use the health messages in their daily life and are motivated to change their current lifestyle. Learning outcomes were mainly related to biological knowledge; e.g. how the heart functions and how the heart and other bodily functions are affected by physical activity [Ex.4; Ex.17]. After visiting Ex.12, more than half of the adults believed their children learned something about physical activity and just under half the children said the same. Further, a majority expressed intentions to apply the messages to their daily lives. Ex.8 measured learning outcomes of a field trip to the exhibit with a pre- and post-test two weeks before and after the visit, demonstrating increased knowledge of healthy pizza toppings and basic nutritional concepts post visit.

In addition to increasing health related knowledge, most museums aim to change attitudes toward physical activity and healthy eating in a positive direction. Through a journal-based study, Ex.5 demonstrate increased awareness of healthy behaviours in student visitors and their families, while Ex.9 and Ex.17 have sparked health related discussions in the homes of their visitors. Museum experiences do seem to motivate people towards healthy behaviour changes. For example, at Stepping Stones, 90 percent of surveyed visitors state that they are "committed to pursuing a healthy lifestyle" after visiting Ex.9; and several museums [e.g. Ex.2; Ex.12] provide evidence of self-reported intended change following the museum visit. For example, visitors to Ex.4 "often vowed to 'drink more water'" as a result of learning about the effects of water on their body. However, even though increased knowledge might lead to intentions to change, this does not predict behaviour (Sheeran 2002).

Consequently, it is interesting to consider whether exhibitions have succeeded in actually changing people's way of living; thereby demonstrating *intermediate health outcomes*. Ex.2 conducted a study of their health education pilot programme with healthy changes related to eating habits and physical activity. This evaluation was curriculum-based rather than related to the exhibition itself, but emphasises the ability of museums to collaborate with local stakeholders with resulting intermediate outcomes. After leaving out a few anecdotal statements of the expected effects on everyday life, we identified two studies that reported outcomes illustrating behaviour change following exhibit visits. Ex.9 provides answers to the survey question: "how did your visit to [the exhibition] affect you and your family's behaviour?" with approximately half of visitors stating 'making healthier food choices' and 'washing hands regularly'; approximately 40 percent 'being more active'; and just over 20 percent 'using safety equipment'.

Around 15 percent stated that visiting the exhibition did not affect their way of acting. While these results are impressive, there were no details of the methods used, e.g. at what time the survey was conducted. Hence, we cannot judge the quality of the study.

Ex.17 arguably provides the most thorough evaluation of health related outcomes, based on observations; interviews at the end of the visit; and follow-up interviews. Interview responses one month after the visit indicate that physical activity levels were 'definitely' influenced for 27 percent of children and slightly influenced for 45 percent as reported by their parents. These effects were mainly applicable to those who previously judged themselves to be least physically active. The experience is further claimed to have increased children's confidence in their own abilities; their self-efficacy, in addition to knowledge and understanding of their body and its reactions. While the above health-related outcomes were in some cases quite impressive and promising, the fact that they were self-reported to museum staff or evaluators and the widespread lack of specified methodologies leaves reasonable doubt of the solidity of the results. Self-report measures are subject to a number of limitations including bias related to over-reporting because of social desirability (Sallis and Saelens 2000; Adams et al. 1999); recollection problems; and varying understandings e.g. of what constitutes physical activity (Sallis and Saelens 2000).

No reports of *health and social outcomes* are present in the material. Considering the difficulties of relating such outcomes to a single intervention (Green and Tones 2010), this finding is not surprising. In fact, it demonstrates the merits of Nutbeam's framework, which allows us to consider the intermediate steps in promoting health. Green and Tones (2010) asserts that most health promoting initiatives will be only part of a solution to impact health outcomes, necessitating interventions at multiple levels and arenas. They further conclude that if solid evidence exists for determinants of health outcomes, affecting these determinants will be a sufficient outcome (Green and Tones 2010). We therefore contend that solid results of intermediate health outcomes will be sufficient to demonstrate the merits of health exhibitions.

A major limitation to the findings reported in the exhibition material is that the methods used and the drawn conclusions are rarely transparent and a quality assessment is therefore not feasible. According to Scott (2003), impact evaluations in museum studies are yet to be integrated as a research practice. Considering this, in addition to the nature of our diverse material with few research papers identified, it is not surprising that the purpose and quality of the evaluations conducted in relation to these exhibitions did not yield thorough results in relation to health outcomes. Thus, solid studies evaluating health related outcomes would greatly enhance the knowledge base.

Conclusion: implications for practice and research

With developers emphasising the benefits of including current research evidence in health exhibitions [e.g. Ex.14], health researchers may consider collaborating with museums to mutual benefit. One of the most urgent needs for research identified in this study, however, is that of evaluating health related outcomes of health exhibitions. Science centre professionals traditionally focus on subjects relevant to exhibition development, cognitive outcomes and visitor satisfaction (Friedman 2007), leaving a gap for researchers to evaluate outcomes related to health promotion.

A number of challenges to conducting thorough evaluations of health outcomes at museums can be identified. The informal nature of the setting may pose challenges to recruiting participants, especially for follow up studies (Carney et al. 2009). For museum staff, a major limitation to conducting evaluation studies themselves is often a lack of staff resources to do such time demanding work [Ex.12]. Museum visits are usually short and far between which makes it hard to achieve long-term change if it is a standalone intervention (Friedman 2007), and even if this is accomplished tracing health effects to this particular intervention may not be possible. Therefore, realistic goals for health related outcomes should be set from the beginning of the project (Green and Tones 2010). We argue that these may beneficially target all five of the Ottawa action areas. In this study, the outcome measures have a predominantly behavioural focus, thereby not addressing the less tangible aspects of intermediate health outcomes such as healthy environments. Future studies of broad interventions should incorporate these aspects.

Publication of thorough evaluations of health promoting exhibitions, including long term follow up studies and direct measurements using e.g. accelerometers, would fill a void in the current literature and provide knowledge of whether science centres and museums can actively promote health through exhibitions. The large number of health exhibitions aiming to affect people's lifestyle calls for a response to this question. For the health promotion research community, museums and science centres provide a novel and informal setting, which may hold great potential for implementing broad and innovative health initiatives and reaching new target groups.

We initially presented Pedretti's (2002) contention that science centre and museum trends currently move towards creating issues-based exhibitions on socio-scientific themes, striving to raise critical consciousness and fostering open-ended learning. Friedman (2007)

elaborates that museums need to advance from understanding audience needs to a broader societal concern with their communities' social agenda and needs. As is evident in our literature review, many museums do indeed strive to tackle health related issues, and imbed their exhibitions in the local health agenda. In the following, we consider what this orientation implies for health promotion; visitors; and museums respectively.

It is our contention that museums possess unique qualities conducive to health promoting initiatives. Although museums may not appeal to all audiences (see e.g. Dawson 2012), compared to clinical settings they may prove more approachable (Camic and Chatterjee 2013), and, through their disseminative expertise and knowledge of different audience groups, more sensitive to the complexities and dynamics of everyday life. Several of the reviewed exhibitions work towards being inclusive to the entire community, e.g. through free nights or reduced entrance fees for eligible groups [e.g. Ex.12; Ex.15; Ex.18]; and multilingual and culturally sensitive exhibitions to increase economic, social and cultural accessibility.

Together, the exhibitions covered a broad range of health topics, but most primarily focused on physical activity and nutrition. The Ottawa Charter states empowerment and equity as intrinsic to health promotion (WHO 1986) and we hold that these concepts could beneficially be introduced into health promoting exhibitions. In this regard, using the museum setting may be a way of creating greater health equity if museum developers are sensitive to the cultural context and the various needs of different target groups, and succeed in reaching groups that feel alienated from traditional health settings.

There is evidence that science centre visits impact interest, inspiration and appreciation (Friedman 2010). Keeping in mind the difficulties of affecting health practices through a stand-alone intervention, efforts to establish synergies between projects and institutions and ensuring that various local initiatives support each other's aims may be the key to strengthening the health promotion potentials of health exhibitions. While museum employees are not necessarily health experts, their expertise in communicating complex matters in a fun and accessible way make them promising partners for health education [see e.g. Ex.2].

The open-ended learning opportunities promoted by e.g. Pedretti (2002) and Hennes (2002) were not very prominent in the material, as exhibitions were generally clear and unambiguous in their communication of health topics. Providing clear messages is what is usually strived for in exhibition development; nevertheless, in line with the development towards open-ended learning and inviting discussion, new directions may be relevant, e.g. promoting discussion of different concepts of health. For instance, Ex.13 provided visitors with an

opportunity to reflect on personal values; e.g. what the good life is like in old age, with no set answers, thereby allowing them to reflect on their own values in comparison to other visitors. This is in line with Quistgaard and Kahr-Højland's (2010) argument of avoiding definite truths in favour of initiating discussion and reflection, which Hooper-Greenhill (2000) argues is in demand from visitors. Conversely, others argue that museums may be reluctant to confuse visitors, who may expect to be told 'the truth' and are not necessarily comfortable with complex and ambiguous issues (Hennes 2002; Pedretti 2002). Thus, while these new directions are highly relevant to the health promotion field, it is debatable whether visitors are interested in engaging with such issues. According to Hennes (2002), visitors mainly attend museums to have an enjoyable social experience in their leisure-time based on existing interests. A schism may thus exist between the view of science centres as fun places for learning about science as opposed to places for controversial discussions and health preaching; a problematic identified by several exhibitions [Ex.6; Ex.11; Ex.18] . Particularly, receiving personal health related information such as BMI and other health measures [e.g. Ex.10] may be a disheartening experience.

In conclusion, these challenges make it worth discussing the role and agenda of science centres and museums in health promotion, and by which approaches and in which format they can contribute to the dissemination of health messages. Since health exhibitions are proliferating, it is worth studying their potentials and means for disseminating health and reaching out to communities to make an impact on everyday life. This involves discussing the underlying concepts of health including whether the responsibility for health is primarily placed on the individual; as well as how to achieve long lasting health related outcomes from exhibitions. Based on the previous discussion it is our contention that such initiatives hold potential for promoting health across the population if they build on solid research such as the recommendations and empowerment ideology of the Ottawa Charter. Health exhibitions can thereby expand the scope and positive community influence of museums.

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Footnotes

1. While acknowledging the differences between the various types of institutions, in the following we use 'museum' as an overall term for science centres, science museums and children's museums.

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Tables and figures

Figure 1. Flow chart of search strategy.

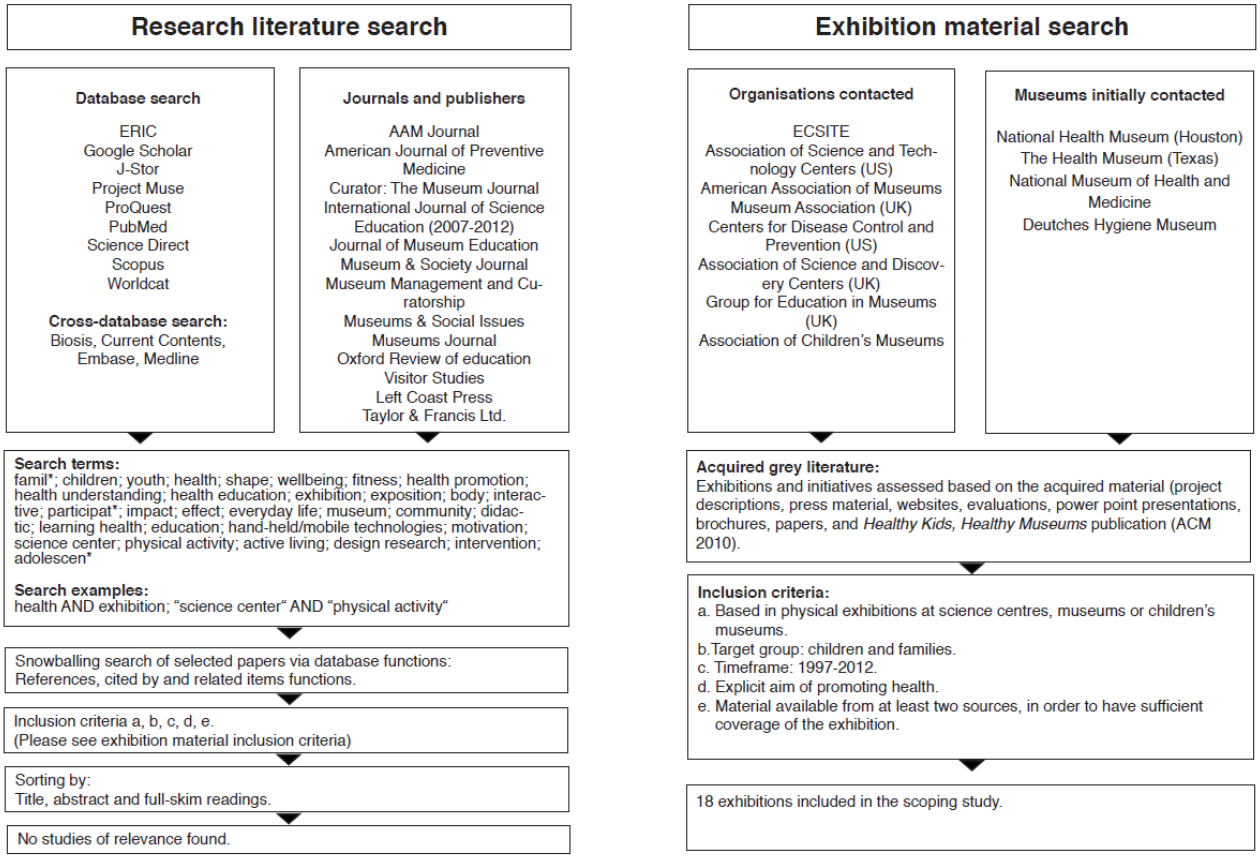
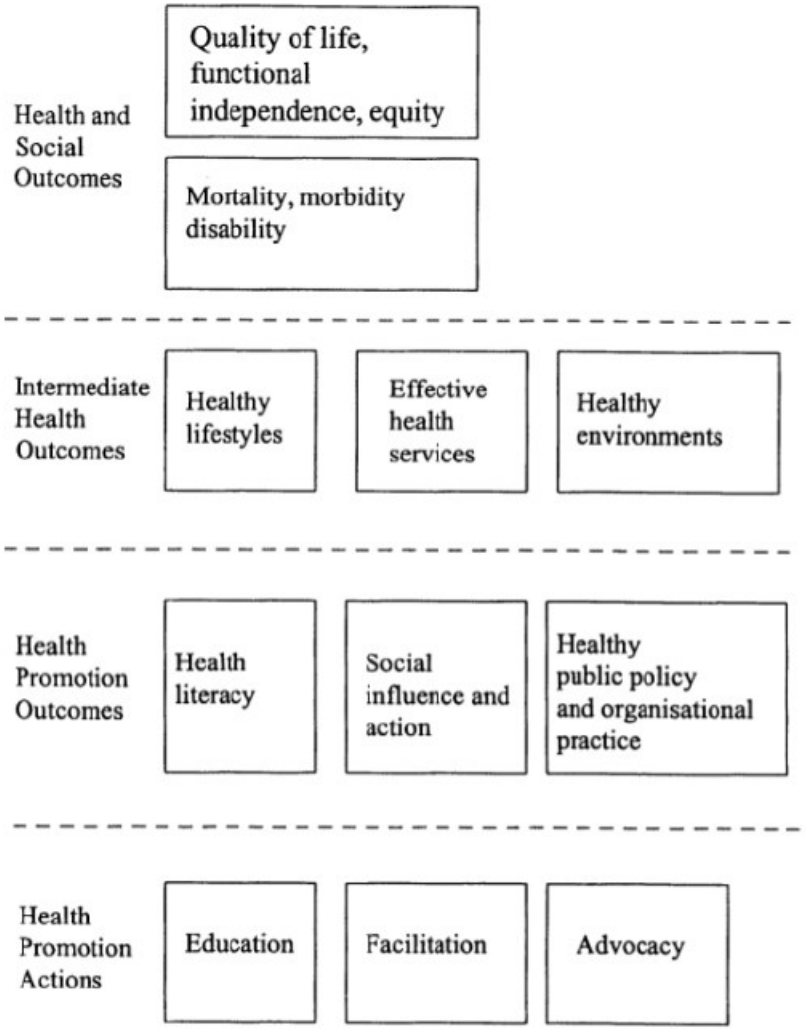


Figure 2. Nutbeam's (1998) framework of health related outcomes.



(Nutbeam 1998, 30)

Table 1. Overview of health exhibitions.

Table 1. Overview of Health Exhibitions

Ex.#	Title, nationality, year	Materials	Target group	Programme design	Aim/mission	Health focus
1	**Big ED Health Initiative** *EdVenture Children's Museum*, South Carolina, USA. Mid- 2000's →	• Paper in *ACM 2010* • Homepage • Brochure • Award press release	Families with children aged 0-12.	Eight exhibits and two travelling galleries. Circus-based event, nature walks, kayaking, fitness event, bicycle rodeo, sun and water safety event, food tasting event, football training camp and Olympic-inspired games.	Increase PA and create healthy eating for museum audiences habits while having fun.	PA, nutrition, wellbeing and fun.
2	**EatSleepPlay,** *Children's Museum of Manhattan*, New York, USA. 2011→	• Homepages • Press releases • Evaluation report • Evaluation summary	Families with young children of all backgrounds.	Exhibition with installations and dilemmas for reflection and discussion. Public programmes and internet resources. Crawl through a giant brain or intestines and learn how they function. Get active, test your strength. Family programmes and professional development.	Empower families to make informed decisions related to nutrition, PA and sleep to establish lifelong positive habits.	Nutrition, PA and better lifestyle choices. How sleep affects the body.
3	**Eat Well, Play Well** *Oregon Museum of Science and Industry (OMSI)*, Oregon, USA. 2006 →	• Two evaluation reports • Project description • Homepage • Case study	Families with children ages 5-10, school groups grades K-5, Latino families and students.	Bilingual (English and Spanish) travelling exhibitions on nutrition and PA, website, teachers' guides, family guides, workshops, learning programmes, and presentations. Clinical research is emphasised as a resource for knowledge on nutrition and health.	Promote intergenerational learning about healthy nutrition and PA, and informed lifestyle decisions. Increase scientific literacy through information about the role of clinical research in creating recom-mendations about nutrition and PA.	Physical activity and nutrition.
4	**Expedition Health** *Denver Museum of Nature And Science*, Denver, Colorado, USA. 2009→	• Garneau & Hostetler 2010 • Cochran et al. 2013 • Press release • Homepage • Evaluation reports	All ages, especially families with school aged children and school classes.	Science exhibition mirroring a climb up mount Evans. Participants learn about their body (e.g. cardiovascular health and controlling brain waves) and how to measure and optimise it. Centred on what happens to visitors' own bodies during different stimuli to increase personal relevance. Website with access to personal profile based on data generated from visit.	Learning about health in fun ways. Making health and body knowledge interesting through personal relevance and thereby sparking healthy changes in everyday life.	Empowerment through knowledge of health and body in relation to science, society, environment, genetics, lifestyle.
5	**Hands-on Health;** Run! Jump! Fly! *Minnesota Children's Museum*, Minnesota, USA Approx. 2006 →	• Paper in *ACM 2010* • Homepage	Children aged 6 months to 10 years. Schools, teachers, and professionals.	A number of activities and programs. Run! Jump! Fly! encourages children to get active, with action adventures and areas highlighting different physical challenges, e.g. strength, balance, speed, coordination. Museum classes, discovery trunk, health program, and professional development workshops.	Health and fitness education; teaching how the body works, and the impact of fitness and nutrition, and how to make healthy choices.	Body system and functioning, nutrition, fitness.
6	**Health House,** *The Children's Museum of Indianapolis*, USA. 2007 →	• Paper in *ACM 2010* • Homepage • PlayFit homepage	Families with children aged 4-8.	Exhibition shaped like a house; each room focusing on healthy habits of daily living: food preparation, getting off the couch, brushing teeth, etc. Website about health, nutrition, and exercise through interactive games. Online journal to track family health behaviour.	Impact behaviour post-visit by helping families learn about health, nutrition and fitness together.	Nutrition, fitness, fun, safety, hygiene, and the importance of sleep to health.
7	**Healthy Lifestyles and Fitness for All** *Kohl Children's Museum, Chicago*, Illinois, USA. 2005 →	• Paper in *ACM 2010* • Homepage	Families with children aged 0-8. School group grades preK-3.	Onsite activities include a grocery store with 'choose healthy food' approach and outdoor exhibitions for physical activity supplemented with facilitated activities. Community outreach programmes work directly in schools and childcare centres of need.	Encourage healthier food choices and more outdoor activity, and more time together in the family to improve health and combat childhood obesity.	Nutrition, physical activity, outdoor play.
8	**Healthy Pizza Kitchen** *Hall of Health*, Berkeley, California, USA. →2009	• Freedman 2010 • Poster session link	Multi-ethnic 5th grade students.	Visit to the Health Hall with presentation on nutrition with subsequent visit and hands-on exploration of the nutrition exhibition; a mock-pizzaria, with pizza 'building blocks'.	To educate about the nutritional value of pizza and how to recognize and use healthy topping alternatives.	Nutrition.
9	**Healthyville** *Stepping Stones Museum for Children*, Connecticut, USA. 2006 →	• Paper in *ACM 2010* • Summative Exhibition evaluation 2011 with visitor feedback • Homepage	Families with children. Focus also on Hispanics and low SES families.	Exhibit with a number of attractions, hands-on activities and computer games about the brain, the digestive system, health grocery shopping and nutritional value of groceries, etc. Part of the four year, state wide program *Healthy Children, Healthy Communities.*	Affect individual behaviour by teaching children about nutrition, fitness, hygiene and safety. To improve long term health of children and communities.	Fitness; nutrition; hygiene; bike safety; asthma and allergies; sleep and stress; early development; and the role of children's play.
10	**HeartSmart** *Miami Science Museum*, Florida, USA Approx. 2009 →	• Saab et al. 2010 • Homepage • Fact sheets • Arts and Science	All age groups; directed at children in particular.	Science exhibition with interactive stations (e.g. hula-hoop and a lifestyle quiz) and personal measurement; e.g. blood pressure, body mass index and waist circumference. Personalised feedback on results. Supplemented with access to website with own data.	Promote small changes to improve health and taking control over lifestyle. Engage visitors in research by using their data for research purposes, and by informing about	Focus on heart health: Nutrition, physical fitness, stress-reduction. Biological parameters for health.

1

Table 2. Analytical results.

Ex.#	Ottawa Charter 1. Build healthy public policy	Ottawa Charter 2. Create supportive environments	Ottawa Charter 3. Strengthen community action	Ottawa Charter 4. Develop personal skills	Ottawa Charter 5. Reorient health services	Nutbeam Health and social outcomes	Nutbeam Intermediate health outcomes	Nutbeam Health promotion outcomes
1	-	-	"(...) invite community partners to serve on an external advisory committee" (ACM 2010)	"health-focused lectures for parents" (ACM 2010). "arsenal of educational resources, exhibits and programs to promote scientific and cultural literacy" (brochure)	Partner: e.g. Providence Hospital. "The steering committee grew to include dentists, pediatricians and other physicians (...)" (ACM 2010)	-	-	-
2	"a pilot project to impact nutrition policies at eight Head Start centers throughout New York City" (press release)	-	"exhibit replication plans for national distribution with small museums and community centers; a new early childhood obesity prevention curriculum; family health programs at the Museum; obesity prevention outreach programs in high-need communities; professional development programs for childcare providers, health professionals and teachers" (Homepage)	"supports families in making simple changes in the area of nutrition, sleep and active play to build a healthy mindset and positive, lifelong habits." (Homepage) "before leaving the EatSleepPlay exhibit, families will be encouraged to select a goal that improves one aspect of their health. CMOM will follow up by providing support and encouragement to families through its public programs, online resources and opportunities to share their real life accomplishments" (Press release)	"An advisory group of renowned public health officials and health professionals, including the National Institutes of Health (NIH), guided the exhibit's concepts and content." (Press release)	-	-	"28% of parents rated the exhibit's ability to teach their children about healthy habits as good or excellent while 94% rated the exhibit's ability to teach the parents themselves as good or excellent" "Almost 60% of parents indicated that they learned something at the exhibit that would cause them to make changes at home in regards to nutrition, sleep, or activity level for their family" (Evaluation summary)
3	-	-	-	primary goals: "1) promote intergenerational learning about healthy nutrition and PA (...) 2) (...) to increase visitors' scientific literacy and encourage them to make informed healthy choices; and 3) encourage (...) practicing healthy decision making and helping [families] find ways to overcome common barriers to healthy decision making." (Homepage)	-	-	-	Thorough front-end evaluations, but no outcome evaluation.
4	-	-	"online teachers' guide to the exhibition and includes background health information and classroom activities" "Classroom programs on health for school groups" "virtual classes through videoconferencing" "extends the experience of the (...) exhibition to fifth graders at 30 low-income schools (...). It provides field trips, family days, and resource materials." (Cochran et al. 2013)	A human biology exhibition with an empowering health message: 'your body changes in ways you can see, measure and optimize" Primary goal: "to have an educational, enjoyable, and social experience revolving around health" (Garneau & Hostetler 2010)	-	-	-	Visitors "learned about themselves and their own bodies" Open-ended survey questions. "Approximately 50 percent of both adults and children described either what they had learned about themselves or actions that they could take to promote their own health and well-being." (Evaluation report)
5	-	"a group of museum staff facilitated (...) workshops on health programming, visitor interactions and staff wellness, led tours through museum galleries to analyze PA opportunities and provided a healthy lunch—and pedometers— for museum staff." (ACM 2010)	"staff development workshop for second grade teachers and physical education teachers on nutrition and body systems as they relate to fitness education." "Educators can try, first hand, the activities from the curriculum and learn effective teaching methods and ways to encourage student engagement." (ACM 2010)	Educational activities pre- and post-visit and on-site. Lesson plans for schools: "The immersive, playful and engaging learning environment kept the students motivated and also provided an opportunity for them to use their knowledge about the role of nutrition and exercise in being healthy" (ACM 2010)	-	-	-	"students and their families kept a daily journal of the foods students ate and the exercise s/he participated in during a three-day period—one journal before and one after the program. (...) Post-journals showed an increased awareness in healthy behaviors in comparison to the pre-journals." (ACM 2010)
6	-	-	-	"reminds them to make healthy choices (play, choose healthy snacks, brush your teeth and sleep)" (ACM 2010)	Partners included a physician in developmental pediatrics from a prominent local children's hospital, two pediatric nutritionists from a local university, a pediatric dentist (ACM 2010)	-	-	-

Appendix 2: Empirical Material

Family interviews[23]

Synonym	Date	Methods	Materials	Area
AJ-H	22.01.15	Interview	Audio, notes, transcription	Husum (Voldparken)
AW-G	02.12.12	Design workshop, interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
BB-H	29.11.12	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj
B-G	02.12.12	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
BT-H	10.03.13	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj (Voldparken)
E-G	09.12.12	Design workshop, interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
F-H	17.12.14	Interview, mapping exercise	Audio, photos, map, notes, transcription	Husum-Brønshøj (Voldparken)

[23] Here the families have been anonymized using an alphabetical system. In the articles, the families have been given numbers according to their order of appearance, for the sake of simplicity.

HT-H	21.02.13	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj
J-H	9.12.14	Interview, auto-documentation of Xbus	Audio, photos, notes, transcription	Husum-Brønshøj (Voldparken)
EJ-H	17.12.14	Interview, auto-documentation of Xbus, mapping exercise	Audio, photos, notes, map, transcription	Husum-Brønshøj (Voldparken)
KS-H	28.12.12 + 18.03.13	Interview, photo diary, calendar exercise, fieldshop	Audio, calendar, fieldshop material, notes, photos, transcription, video	Husum-Brønshøj
J-G	07.01.13	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
L-G	09.04.13	Interview	Audio, photos, notes, transcription	Hellerup-Gentofte
LA-H	12.01.15	Interview	Audio, photos, notes, transcription	Husum-Brønshøj (Voldparken)
ML-G	17.12.12	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
M-G	11.04.14	Interview	Audio, photos, notes, transcription	Hellerup-Gentofte

P-H	03.01.13	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj
P-G	10.12.12	Design workshop, interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Hellerup-Gentofte
R-H	29.04.13	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj (Voldparken)
T-H	27.12.12	Interview, photo diary, calendar exercise	Audio, calendar, notes, photos, transcription	Husum-Brønshøj
S-H	26.04.13	Interview, photo diary	Audio, notes, photos, transcription	Husum-Brønshøj (Voldparken)
ZL-H	25.02.13	Interview	Audio, notes, transcription	Husum-Brønshøj (Voldparken)

Expert interviews

Name	**Title**	**Date**	**Materials**
DJ	Project Manager, HFA	13.11.12	Audio, transcription
AS	Project staff, later project manager, HFA	20.11.12	Audio, transcription
MSA	Teacher , physical education [bevægelsesvejleder], Husum Skole	20.09.16	Audio, transcription

Experimentarium staff interviews

Name	Title	Date	Materials
BP	Pulse project manager (PLA development)	12.12.14 24.11.16	audio recording, transcription, notes
KH	CEO	24.11.16	audio recording, transcription, notes
LI	Director of Development	11.10.16	audio recording, transcription, notes
MS	Pulse project manager (exhibition development)	15.01.15 16.12.16	audio recording, transcription, notes

PULSE development process, including meetings, seminars, presentations, etc. [24]

Event	Place	Date	Purpose	Participants	Material
Pulse seminars	Experimentarium	Recurrent-ly January -June 2013	Share Pulse process and results with project team, stakeholders and other interested parties	Pulse team, stakeholders and other interested parties	Notes and presentations

[24] The list only contains 'official', scheduled events with predefined agenda. Ad hoc meetings, informal conversations and one-on-one exchanges do not figure, but are part of the field diary and empirical material. Steno research group meetings and CoRe research group meetings with presentations and discussions of the empirical material and analysis do not figure as empirical material, but have taken place recurrently.

Pulse team meetings	Experimentarium	Weekly January -June 2013	Exchange and coordinate on Pulse process	Pulse team	Notes
Pulse workshop	Experimentarium	07.02.13	Presentation of fieldwork results and their use in the exhibition development process	Pulse team	Notes, presentation
Meeting	Gentofte Municipality, department of Prevention and health promotion	07.02.13	Presentation and discussion of fieldwork results from Hellerup-Gentofte	Gentofte Municipality, department of Prevention and health promotion	Notes, presentation
PAA meeting	Experimentarium	04.03.2013	Presentation of fieldwork results and their use in the PAA development process	PAA team	Notes, presentation
PAA workshop/ fieldshop	Experimentarium/ Husum-Brønshøj	18.03.13	Generation of ideas and mock-up for PAA	Pulse AA team, Husum-Brønshøj familie, design consultants	Notes, video, photos
Husum health network	EnergiCenter Voldparken	Every other month,	To share experiences and coordinate activities and	PAA representatives, the Husum Area Renewal	Notes

meetings		2014-15	interests in Husum	Secretariat, the Local Committee Secretariat, the Volunteer Association, the Housing Association and the Health- and Care Department of the Municipality of Copenhagen	
Xbus planning	Experimentarium	08.10.14	Preparation for Xbus	Pulse AA team	Notes
Xbus kick-off meeting	Experimentarium	17.10.14	Preparation for Xbus	Pulse AA team, Experimentarium/Steno staff participating in Xbus	Notes
Xbus planning	Experimentarium	18.10.14	Preparation for Xbus	Pulse AA team	Notes
PAA meeting	Experimentarium	20.11.14	Status and process planning	Pulse AA team	Notes
PULSE evaluat	Experimentarium	24.11.14	Developing evaluation framework and	Pulse team	Audio, notes, photos

ion workshop			defining success criteria		
PULSE evaluation workshop	Experimentarium	December 14	Developing evaluation framework and defining success criteria	Pulse team	Audio, notes, photos
Husum fieldwork meeting	Experimentarium	10.12.14	Analysis and discussion of fieldwork in Husum	Husum researchers (JB, CPS, SRM)	Notes
Husum fieldwork meeting	Experimentarium	15.01.15	Analysis and discussion of fieldwork in Husum	Husum researchers (JB, CPS, SRM)	Notes
PLA workshop planning meeting	Experimentarium	19.01.15	Planning and preparing PLA workshop in Husum	PLA team	Notes
Debriefing, PLA workshop	Experimentarium	20.02.15	Debriefing the workshop and process planning	PLA team	Notes

PLA workshop preparation meeting	Experimentarium	18.02.15	Planning and preparing PLA workshop in Husum	PLA team	Notes
PLA workshop	EnergiCenter Voldparken	19.02.15	Idea generation and selection of ideas for PAA in Husum	PLA team, members of the health network, the area renewal secretariat, the municipal health center, municipal consultants, teachers and the housing associations	Audio, notes, design material, presentations, video,
PLA meeting	Experimentarium	06.03.15	Status and process planning	PLA team	Notes
PLA meeting	Experimentarium	27.04.15	Status and process planning	PLA team	Notes

Observations

Event	**Place**	**Date**	**Materials**
The 2700 Run	Voldparken, Husum	09.06.15	Notes, photos, video

Eid-celebration	EnergiCenter Voldparken, Husum	17.10.14	Notes
FerieCamp	EnergiCenterVoldparken, Husum	11.02.13	Notes, photos
Idémøde for Husum-borgere	Energicenter Voldparken, Husum	25.10.12	Notes
Pulse Agility Course	Husum School, Husum	02.02.15	Notes, photos,video
Xbus	Experimentarium, CHØ	27.10.14	Notes, photos

Meetings with US Museum professionals

Name	**Title**	**Date**	**Material**
AS	*Director, Education and Enrichment Programs*, Boston Museum of Science	02.04.15	Notes
ES	*Director of Exhibitions,* Long Island Children's Museum	25.03.15	Notes
KK SCM	*Director of learning and experience*, *Director of Exhibit Design and Delivery,* Stepping Stones Museum for Children	26.03.15	Notes
LS SM	*Director of Exhibitions* *Community outreach* Boston Children's Museum	30.03.15	Notes

Health promoting Exhibitions in the US

Exhibition	**Museum**	**Date**	**Material and methods**
EatSleepPlay	Children's Museum of Manhattan	24.03.15	Notes, participant observations, photographs, online material, video

Express Yourself	Stepping Stones Museum for Children	26.03.15	Notes, participant observations, photographs, online material
Hall of Human Life	Boston Museum of Science	02.04.15	Notes, participant observations, photographs, online material
Healthyville	Long Island Children's Museum	25.03.15	Notes, participant observations, photographs, online material
KidPower	Boston Children's Museum	30.03.15	Notes, participant observations, photographs, online material, video
Move It!	Chicago Children's Museum	10.04.15	Notes, participant observations, photographs, online material, video
You! The exhibit	Chicago Museum of Science	11.04.2015	Notes, participant observations, photographs, online material

Other:

Xbus voxpops 27.10.14

Synonym	Age	Gender
AM	45	M
AF	9	F
ME	43	F
NN	8	F
SC	42	F
T	11	F
TM JM	38 7	M F
VS	49	M

Appendix 2